RAILROAD GAZETTE

FRIDAY, SEPTEMBER 4.

Progress in Boiler Construction.

[Report of the Boiler Committee of the Master Mechanics' Association at the convention last June.]

This report, concerning the progress in boiler construction to date, is prepared by Mr. J. Davis Barnett, of the Grand Trunk, then Vice-President and since elected President of the Association. The other two members of the committee, Messrs. Jacob Johann and Allen Cook, explicitly give him the entire credit for its preparation. After saying that the poor results obtained by issuing circulars had led to no circular being sent out, the following summary is given: the discussion was, in fact, after the whole report had been read, but for convenience we interpolate that portion of the discussion relating to each section immediately below it:

STEEL PLATES.

Steel was reluctantly used in 1869 (see p. 10 of report for that year), but 200 boilers of steel are reported in 1875 (p. 15), and it is recommended in that year (p. 16), exclusively recommended in 1877 (p. 52), and the committee is unanimous in 1878 (p. 86). In 1880 an opinion from a French engineer was quoted (p. 18), saying steel plate for boiler use should be capable of hardening; presumably he was using the metal in barrel plates, and to reduce their thickness and weight, required a metal of high tension, which he would secure in a steel that tempered by immersion; but in 1871 (p. 10) the complaint was that it was manufactured too hard, and in 1875 (p. 16) steel that will not harden is recommended, more especially for fire-box service. The steel we now easily procure and should use for both sheets and furnace, has but a small percentage of carbon—say from 0.15 to 0.20 per cent., and therefore, if fairly free from silicon, phosphorus, etc., will not harden. It is mild and ductile, working under the hammer, even when cold, most freely; has a breaking resistance of from 62,000 to 65,000 lbs. per square inch of section, with an extension of 24 to 25 per cent. in a length of 10 in. A good shop test—in addition to bending over at a point in test piece where it has been punched either cold or after it has been heated and dipped in water—is to take a narrow strip through which a hole one-fifth its width is punched and then enlarge the hole with a drift and flagging hammer to fully three times its original punched diameter without splitting the strip.

It may be said that there is now no practical limit to the size that steel sheets of desirable quality and thickness can be procured. The Central Pacific are making the straight portion of wagon-top boilers in one plate, and receive sheets 14 ft. 3 in. by 8 ft. by $\frac{7}{16}$ in., and last year at Erie, Pa., $\frac{5}{8}$ in. plates 16 ft. long were bent cold in rolls to a curve of 30 in. radius, so that two sheets made one boiler 16 ft. long and 60 in. diameter, with but two longitudinal joints in barrel. Mr. Webb has rolled from ingot and used $\frac{7}{16}$ in. steel plate 11 ft. 3 in. wide, by 12 ft. 9 in. long, in one barrel ring. This practice is in line with the strong recommendation of the committee in 1871 (p. 14); but, as they point out, it requires special rolls to be built for bending the plate. Mr. G. S. Strong says he is now constructing a 56-in. straight boiler for 175 lbs. pressure, with all longitudinal seams welded. Welded seams, when iron plate and coke fire were used, give at least but an ultimate tension of 14 long tons and 6½ per cent. extension for 22-ton iron; therefore, it is not a matter of surprise that such a form of joint was seldom used; but now Mr. S. Fox, using 22-ton mild steel and common gas flame for heating the scarf, secures a weld having an ultimate tension of 21 tons and an elongation of 8½ per cent. in a 10-inch length; that is, an increase of 50 per cent. in strength and 30 per cent. in ductility; although it should be noted that this excellent result is but one-third the ductility of the unwelded steel plate. Some careful experiments show that very mild steel, after annealing, loses somewhat in resistance to ultimate tension and in ultimate percentage of extension, or, in other words, annealing does not necessarily improve the natural plate. Nevertheless, if holes are punched in the plate, or it has been flanged or set when warm, mild steel must be annealed, the annealing furnace temperature not being carried too high—a blood or cherry red is quite sufficient—the time in furnace not prolonged beyond the point that will secure thorough and equal temperature, and the cooling not too much hurried by contact with damp earth, or a current of wind at low temperature. Neither should there be any attempt to "soften off" by cooling in a bed of sawdust or ashes.

If the flanging, setting or any other distortion, such as bending in the rolls, can be done cold, there is no necessity for annealing either plates or bars, but all such setting is preferably done under the steady pressure of hydraulic tools.

Discussion.—Mr. SPRAGUE was ready to indorse steel for boilers and fire-boxes, but not for rivets. One member only reported that he had abandoned steel for iron on a small number of engines, while, *per contra*, Mr. J. H. SETCHEL mentioned that out of 40 Baldwin and 10 Grant engines furnished the Ohio & Mississippi, *no* fire-boxes had been renewed in any part in two years of very hard service, averaging 4,500 to 5,000 miles per month. Mr. WOODCOCK had several engines which had been in use since 1869 with steel crown-sheets still in them. Steel fire-boxes were making 175,000 miles. The CHAIRMAN gave the Pennsylvania experience of 91 engines, averaging 219,926 miles before the steel fire-boxes failed (renewed throughout), one reaching 505,890 and the lowest 55,860. He thought the average high. Mr. STEVENS found on the Lake Shore that one crown-sheet would wear out two tube-sheets and four side-sheets. Many others bore testimony in favor of steel.

DRILLING VS. PUNCHING.

In 1872 (p. 19) preference is given to drilling rivet-holes rather than to punching, but with the leather-like ductile metal now supplied and within the limits of ordinary thickness of boiler plate used in locomotives, the extra expense of drilling is not justified, and the excess diameter of hole in die over punch need not exceed $\frac{1}{32}$ in. for plates $\frac{1}{2}$ in. thick and under.

Discussion.—Mr. SETCHEL and others mentioned experiments showing that there was little or no advantage in drilling, the discussion soon ending by an assertion from Mr. LAUDER that, as "he supposed 99 per cent. of the members would continue to punch their plates, no matter what we say here, the discussion had better close."

RIVETS.

Steel rivets are not reported as being in use in 1871 (p. 12), neither are they used to any extent at this date, yet in view of all the conditions of the case, and until the obscure matter of galvanic action and its influence on corrosion, pitting and furrowing is more clearly understood, it would be wiser to use steel rivets with steel plates, thus bringing metals together that are quite similar in nature and electric affinities.

The proportions for riveted joints that suited iron plates have apparently in many instances been transferred to steel plates of similar thickness without any serious question as to their similarity, whereas the weight of the evidence (more particularly the elaborate experiments of Prof. A. B. W. Kennedy for the Institute of Mechanical Engineers) shows that to attain a joint of maximum strength a larger proportional rivet area, to resist shearing, is required with steel rivets and steel plates than with iron, the larger diameter, however, permitting a wider pitch. Thus for single-riveted lap-joints the pitch found best is 2.25 diameters of rivet hole, and for diameter of hole, 2.25 times the thickness of a single plate, the diameter of the rivet being about $\frac{1}{32}$ in. less than the hole. If this proportion should not divide out well the pitch should be increased to 2.3 or 2.4 diameters. This for a ⅝-in. plate will give a ¾-in. hole and 2-in. pitch, a wide departure from average practice in iron plates or in steel plates with iron rivets. The reason for this altered proportion is found (1) in the fact that in a material so ductile as modern boiler steel the joint is helped materially by the great (comparative) excess of strength in the plate after holes are cut through; and (2) that while the plate is comparatively so much stronger than before, there is no corresponding increase in the shearing resistance of the rivets over the strength commonly found in iron rivets.

The average practice in ⅝-in. iron varies from ⅝-in. rivets with 1¾-in. pitch, and $\frac{11}{16}$-in. rivets with 1⅞-in. pitch to ¾-in. rivets with 2-in. pitch as a maximum. A 2-in. pitch is rarely used for any diameter of rivet, and we know of no practice in ⅝-in. plate using rivets of larger diameter than ¾ in.; whereas ⅞ in. would make a stronger and better balanced joint for very mild steel, and will secure a single-riveted joint having 60 per cent. of the strength of the unperforated plate. For double-riveted joints (either lap or butt) using a diameter of rivet that is 3¼ times the thickness of the single plate, the pitch should be approximately four times the diameter, for the thickness of plate commonly used in locomotive practice; the pitch being proportionately narrowed as the tenacity of the plate is higher than 30 long tons per square inch.

The position of the second row of rivets should be such that the net diagonal area of plate, or area along zigzag line, should not be less than 30 per cent. in excess of the net area across the joint, and 35 per cent. is better than 30 per cent.

The general tendency of present practice (a survival from other days and other conditions) is to put too many small rivets in a double joint, as if afraid the joint would leak, but pitches of 3 in. in ⅝-in. plate are tight at 120 lbs. pressure, and in $\frac{29}{32}$ inch plates pitches of 4.14 in. are tight at 160 lbs.

POWER RIVETING.

Machine-riveting by a single squeeze was not approved of in 1871 (p. 70), but the steam piston riveter giving several strokes was. This is now practically superseded by the hydraulic piston, having the merits of the single close squeeze, and the adjustability of the steam piston, producing work of unequaled solidity, and dispensing with the necessity for calking, as boilers are now turned out tight under test pressures of 160 lbs. A large amount of boiler patching, and almost the whole of the work on new tender tanks in position, can be done by the portable hydraulic tools of W. R. A. Tweddell.

A noteworthy point about hydraulic riveting is that even in those cases where it does not increase the absolute strength of the joint, it makes it so much *stiffer* that visible slip does not commence until the pressure is from 100 to 125 per cent. higher than when slip commences in hand-made joints. This explains why hydraulic-riveted boilers do so little weeping under high-test pressure.

Discussion.—Mr. SPRAGUE had rather abandoned power-riveting. Their work was mostly small. Mr. LAUDER thought only a few roads had enough work to use power-riveting, and the question of more general interest was whether to use hammers or drive with a set. He could do three to one with the latter. The CHAIRMAN called attention to the fact that the evidence of the great efficiency of hydraulic riveting did not come from those interested in the sale of such machinery.

CALKING.

One source of danger in boiler manufacture is excessive joint calking (both inside and out) with a sharp-nosed tool so close to inner edge of plate as to indent and in many cases actually cut through the skin of the lower plate. The old style of calking that put a positive strain upon the rivets, thus commencing distortion and putting excessive stress upon rivets (already in high tension) before the boiler commenced work, is, we hope, fast becoming a thing of the past. With a proper proportion of diameter and pitch of rivet to suit steel, all that is required is the use of a light fuller, such as is used by Mr. Webb, of the London & Northwestern, which does not force the joint. The use of a round-nosed tool (of which some good work was shown at the Centennial Exhibition at Philadelphia) is not as good, but it is infinitely better than a sharp-edged calking-tool, which has often started cracks that worked inward or resulted in furrowing.

There is but little need for calking if means are taken to secure a clean metal-to-metal face at the joint. When the plates are put together in ordinary course of manufacture, a portion of the mill-scale (black or magnetic oxide) has been shaken off, but part is left on and this is reduced to powder or shaken loose in the course of riveting, and left between the plates, thus offering a tempting opening for the steam to work through. This is really the cause of the heavy calking that puts so unnecessary a pressure on both plate and rivet.

A clean metallic joint can be secured by passing over the two surfaces waste wet with a weak solution of sal-ammoniac and hot water, an operation certainly cheap enough, both as to materials and labor required. This practice has been carried out with success for years on the London & Northwestern Railway.

The result of such practice is that the riveted joint can be allowed a wider margin beyond outer edge of rivet, permitting the rivets themselves to have the larger diameter, which mild steel absolutely requires; and the rivets can be pitched correspondingly farther apart, as the pitch has often heretofore been controlled more by the resistance required to meet the heavy use of the old calking tool than settled by an investigation into the best proportion to secure the utmost strength for given thicknesses of the good material that is now almost exclusively used in locomotive boilers.

CROWN STAYS.

Crown stays should be "double-plated transverse girders one inch clear of sheet," said the committee in 1869 (p. 10). In 1871, however, the troubles incident to this class of stays are fully recognized (p. 15), and the recommendations are for bars to be fewer and stronger, entirely supported from outer shell, that the clearance underneath be increased, and that washers and distance ferrules be dispensed with.

If this class of stays is to be used, nothing better is shown than the solid steel crown-bar castings (1883, p. 30), but your Committee cannot but continue to emphasize their recommendation for the use of rods screwed through both crowns with their ends riveted over—a plan so old as to have been used in Stephenson's "Rocket," in 1829, and for which a patent was granted in 1848. In 1871 (p. 16) this system is said to be weak, but your committee have been looking for a case of failure in this class of staying without success, even in boilers that have the two crown-sheets so far from being parallel that the stay is a long way from being perpendicular to either sheet. In fact, an angle that permits of but one perfect and complete screwed thread for a continuous circumference, will—if the riveting over be carefully done—prove sufficient to last out the inner fire-box. Bolts with their heads on the inside of the inside fire-box may be safer (see 1880, pp. 61, 62, 63, and 1881, p. 64), but we doubt the necessity for this excess of strength; and so made, it is more difficult to use the twist-drill socket for screwing the stays into plate, as this tool must then be used from the inside of fire-box instead of from the outside.

Mr. Urquhart, mechanical superintendent of the Grazi-Tsaritzyn Railroad, of South Russia, who is burning petroleum refuse (black oil) with such great success in more than a hundred locomotives, says that as one of the results of the high temperature attained in his fire-boxes, many nuts on the stay-bolts of roof dropped off, after which he made heads on the lower ends of these roof-stays; but he goes on to say that the best arrangement is Belpaire's, where the stay-bolt is screwed into both plates and riveted over, thus allowing a free circulation of water over the hottest part. It is to be noticed that many years ago nuts were used on the ends of the screwed stays of fire-boxes burning anthracite, but they are now superseded by riveted heads, and the experiments carried out by the United States Navy in 1879 (see Secretary's report) prove that even if snap-headed, or button-set, they are quite strong enough for their work. The curving and sloping backward of crown sheet, though not approved of in 1871 (p. 16) still recommends itself by offering additional facilities in washing off the sheet.

Discussion.—Considerable difference of opinion, but no very definite information, was developed.

(TO BE CONTINUED.)

Mr. Fink's Views of the West Shore Purchase.

The following letter concerning the plan for the absorption of the West Shore by the New York Central Co. has been received by a gentleman in New York from Commissioner Albert Fink, who is taking a short vacation in Switzerland:

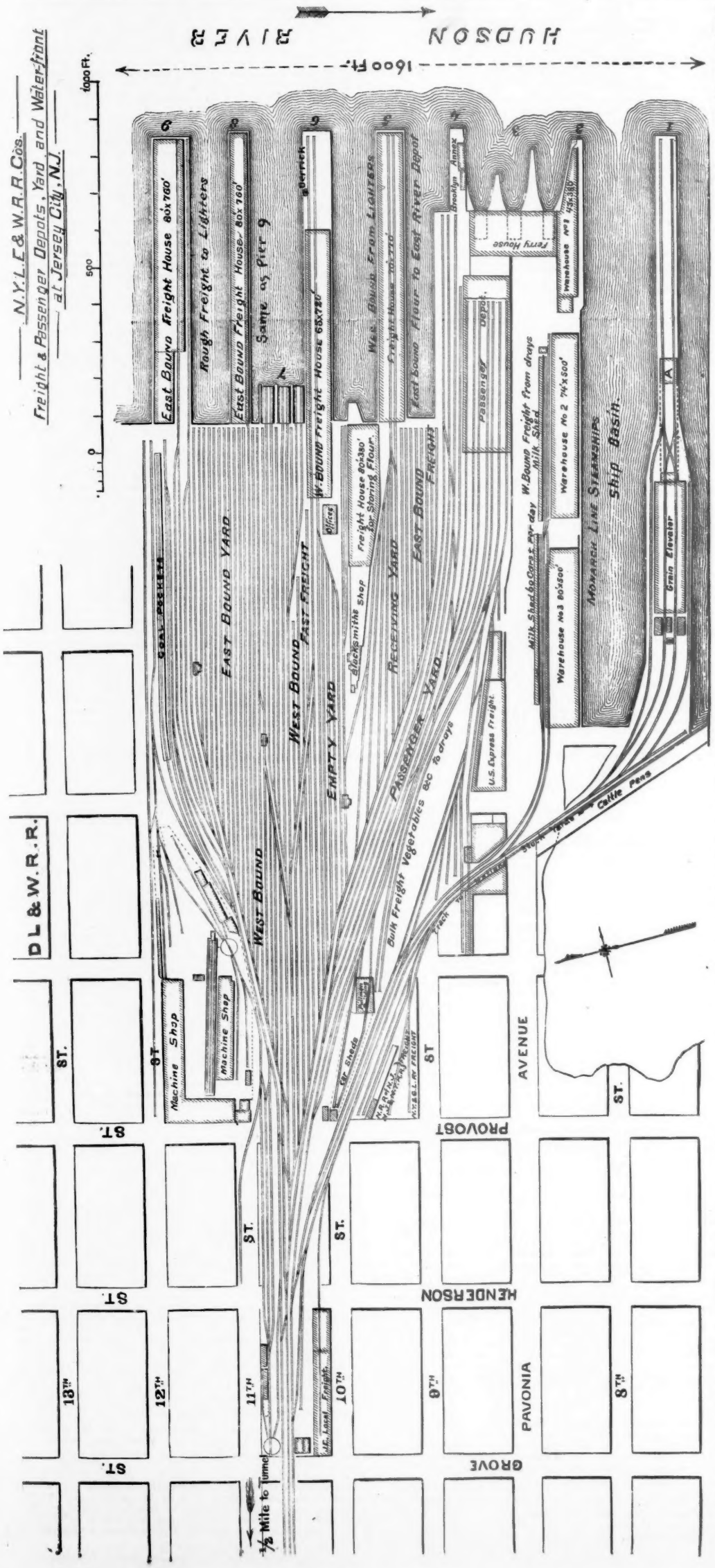
KUSSNACHT, on Lake Zurich, Aug. 18, 1885.

MY DEAR SIR: I am quite willing to give you my personal views on the subject of the proposed lease of the West Shore road to the New York Central Railroad Co., of which you can make such use as you see fit. I am quite willing to assume the responsibility of anything I may say.

First, as to the necessity of the New York Central acquiring the West Shore road, there cannot be the least doubt. These two properties cannot be managed separately to the advantage of their proprietors. The conditions of the traffic are such that the maintenance of fair and remunerative rates by two competing railroads and the canal is almost an impossibility, even supposing that the two managements were disposed to work in harmony. To this subject I have given formerly much consideration, in the hope that some traffic arrangement could be devised between the two companies, but I am free to say that I could never see my way clear to a practical plan that promised to secure permanent peace between them. The only solution of the problem is the consolidation of the two properties, and the only question as to the fairness of the terms under which this may be accomplished. To this subject I have also given heretofore much consideration, and before the present proposition was made, I had in my own mind concluded that the New York Central could afford to guarantee $2,000,000 for the control of the West Shore road. Of course the New York Central could incur no additional loss in the operation of the road under the lease. I am quite sure, however, that the West Shore can be operated by the New York Central without loss, even under the most unfavorable circumstances. The train service which under separate management is almost double that actually required (referring especially to passenger traffic), can always be kept within paying limits, and other economies could be secured which would be impossible under separate management. The most unfavorable result to the New York Central would therefore be the payment of $2,000,000 as a security against the losses resulting from warfare now waged between the two companies upon their local traffic, which losses are now greater than the amount of the guarantee.

The New York Central should not assume any greater risk than justified by obtaining the control of the local business, as the acquisition of the West Shore by the New York Central does not secure the restoration and maintenance of paying through rates; the co-operation of all the trunk lines, including the Baltimore & Ohio, Grand Trunk and Delaware & Lackawanna, is necessary for that purpose; and it is by no means certain that that can be secured at an early day, although it is reasonable to suppose that sooner or later all the trunk lines must work in harmony again. But one of the first conditions that peace may be restored is the elimination of the West Shore Railroad as a disturbing element, and this can only be accomplished by its absorption by the New York Central. In the advantages derived therefrom all the other trunk lines and their Western connections will share. The struggle between the New York Central and West Shore roads affects the tariffs, and consequently the revenue, of some 25,000 miles of railroads, the earning capacity of which is about 40 per cent. of the earning capacity of the whole railroad system of the country. The New York Central, with its connecting roads, forms a considerable part of this system. Looking, therefore, to the benefits to be derived from the re-establishment of proper tariffs on through traffic, the guarantee to be given by the New York Central, apparently large, seems better justified. When peace is restored, the West Shore should able to earn a portion of the sum to be guaranteed. The other trunk lines will have to contribute, as far as the West Shore is in competition with them, to the traffic of the West Shore. The New York Central is not the only sufferer, as it is in its local business.

I estimate that, under ordinary circumstances, when reasonable rates are maintained on through and local business, the gross earnings of the West Shore would amount to from $5,500,000 to $6,000,000 per annum, which should yield under the management of the New York Central about $1,500,000 of net revenue. The result may not be attained the first year, considering present complications between other trunk lines, but as soon as they are settled (and they cannot always remain open) and with the further improvement of the country and traffic, it is reasonable to assume that it will be reached after a year or two, with further increase in the future. The price offered by the New York Central to the West Shore, considering the risks assumed, is a liberal one. The West Shore property has at present little or no value. Considering the practical difficulties in the way of its proper control by the bondholders, there is great danger that it may become a total loss to the bondholders. But as the property has a prospective value, it is but fair that the bondholders and creditors should receive some compensation sufficient to induce them to enter into arrangements that will put a stop to the



further waste of their property that is now going on, and for which there seems no other remedy than that which is now proposed. I consider the proposed arrangement, taking all things into consideration, fair and reasonable to both parties.

The building of parallel railroads, roads that do not create or accommodate new traffic, is a great evil; it is a great waste of capital; a waste of the wealth of the nation. It necessarily increases the cost of transportation. It is true that the parties who get the benefit of the service have not always to pay the increased cost, but others, frequently innocent parties, whose property is affected by ruinous competition, have to bear the losses. Under the laws of the United States railroad building is unrestricted. Hence the necessity of self-protection on the part of existing roads. Struggles between private railroad companies, such as are now going on, and the possibility of which it is difficult for Europeans to understand, are the necessary consequences of the American plan of non-interference with private enterprises. This plan has its advantages, but it has also its disadvantages. The latter we experience now. The fact has to be established that the indiscriminate building of railroads, frequently for mere speculative purposes, is not a profitable enterprise. Capitalists will hereafter give more careful consideration before they engage in such enterprises. The method employed to teach this lesson is a most expensive and wasteful one: yet under the American system of government it is difficult to devise a more rational one. This much may be said, that expensive and wasteful as it is, it is necessary and useful for guidance in the future.

Very respectfully yours, ALBERT FINK.

The New York Terminal Works and Business of the New York, Lake Erie & Western Railroad.

The business of this road extends over many branches and connections throughout the western states and over a large part of the state of New York, and also into the coal and oil regions of Pennsylvania.

Its terminal stations in New Jersey are: The distributing yard, located just west of the tunnel through Bergen Hill; the principal yard and freight and passenger stations and docks in Jersey City, on the west bank of the Hudson River, opposite Canal street, New York, which is 1¾ miles north of the Battery; the coal oil, live stock and export provision depots and docks at Weehawken, opposite Thirtieth street, New York, about 3½ miles north of the Battery.

In New York city are: The flour station on the East River: the principal city freight and passenger station at the foot of Chambers street on the Hudson River: the uptown freight and passenger station at the foot of West Twenty-third street. The Brooklyn station is in Williamsburg, near the piers used by the other railroads.

BERGEN YARD.

This yard is located partly in the entrance cut at the west approach to Bergen Tunnel and partly on a light bank over the Hackensack Meadows, and is crossed overhead by the New York, Susquehanna & Western Railroad by a two-span bridge about one-quarter of the whole length west of the tunnel. The yard is simply a series of sidings parallel to the main tracks, the east-bound yard on the south next the east-bound track consisting of seven tracks, and the west-bound on the north next the west-bound track of five tracks. West of the bridge above mentioned the yard is about one mile long, and the sidings are long and with few cross-overs. East of the bridge the yard is about three-eighths of a mile long and each siding holds about the number of cars generally sent to Jersey City in a train. The round-house and coal-pockets for the road and yard engines are situated just south of the eastern yard. There are 18 miles of available track in the sidings of both yards.

The through fast freight trains for the West are frequently made up in this yard, and the east-bound trains are sorted here in a general way for destination. It is also a storing yard when the Jersey City and Weehawken yards are full, and as it is a union yard for the different branches and connections of the Eastern Division, much work is necessarily done here. There are 4 engines in use during the day and 3 at night; the best have 3 pairs of drivers and 1 pair of forward trucks, with tender. They weigh 37 tons, with 31 tons on the drivers.

There are 15 men employed here constantly on maintenance of way.

JERSEY CITY TERMINUS.

This yard has been developed as the business increased. The city streets all cross at grade, and the four between Grove street and the tunnel are guarded by flagmen and portcullis gates.

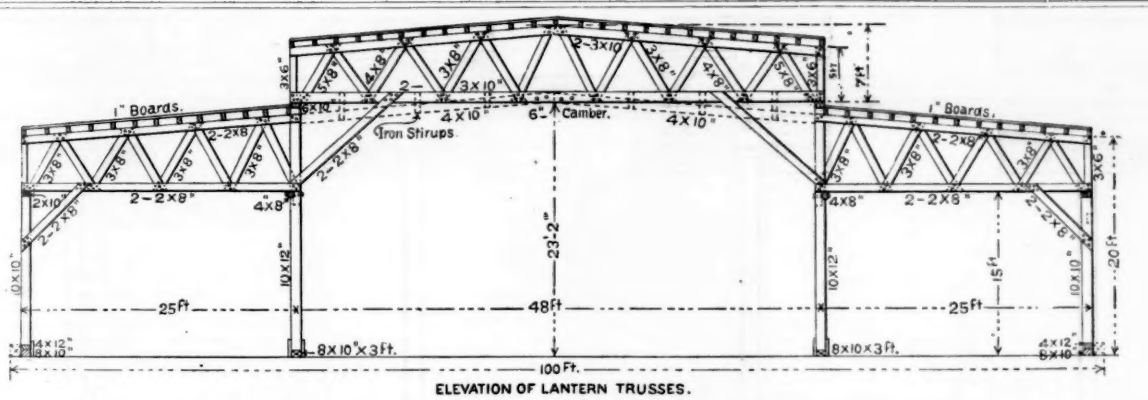
The car repair sheds and shops of this division are just west of Grove street. East of Grove street there are 45 acres in the whole property to the bulkhead. There are about 25 miles of available sidings in this yard, of which 14 miles are used on east-bound, 8 miles on west-bound and 3 miles on passenger business. The yard engines used in this and the Bergen yard are broad-gauge; hence the tracks are all three-rail tracks, requiring additional expense in maintenance. (The third rail is now being removed from the yard, and all the tracks in it will hereafter be of standard gauge only). The freight houses are ordinary one-story sheds; the covered area on east-bound business is 142,000 square feet, on west-bound 64,000 square feet. The general arrangement of business is sufficiently indicated on the plan.

The working force in the yard is 9 engines during the day and 4 at night, with 70 train and yard men during the day and 30 at night, moving from 400 to 600 cars of all kinds each way a day.

There are 25 men on maintenance of track employed in this yard.

The trains moved on this division are heavy, the engines very large and powerful and the grades steep; hence not more than 8 per cent. of the cost of maintenance of cars is chargeable to station work.

With the exception of its location (which necessitates the shifting of all the grain cars across the passenger tracks), the elevator is an excellent example of the economical results of the application of classification and of the use of machinery



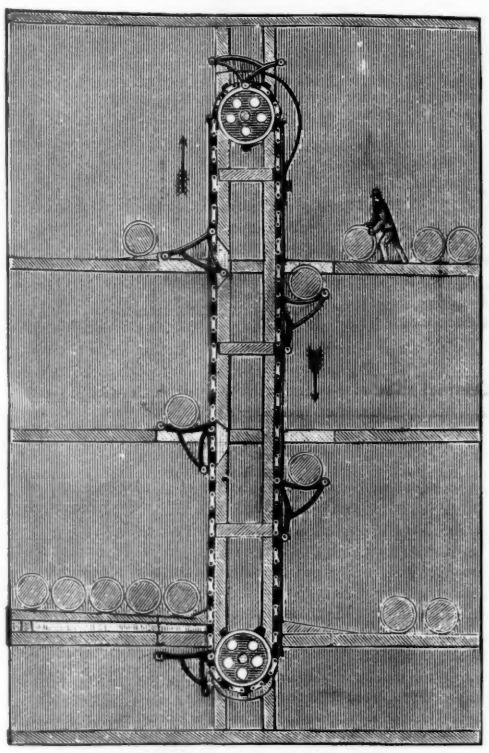
ELEVATION OF LANTERN TRUSSES.

FREIGHT SHED, NEW YORK, LAKE ERIE & WESTERN RAILROAD. PIER 21, NORTH RIVER.

to the work of handling grain. It was built and is operated by private parties.

The pier is extended beyond the elevator for the purpose of transferring grain directly from the cars to lighters, in case it is not necessary to store it in the elevator.

In the small building marked *A* is an elevator, by means of which grain is raised from boats and transferred by belt conveyors into the main elevator building. In the latter there are 10 legs, and the grain is raised from the cars on one track at a time, each track holding 10 cars. When emptied, the yard engine backs the loaded cars in, thus pushing the



Barrel Elevator—Jersey City Yard.

empty cars out on the pier; hence a shift is only made when the pier tracks are full, thus economizing time.

Two yard engines are employed on this work for an ordinary day's work of 150 cars; 310 cars of grain have been handled here in a day, however, requiring three yard engines to move them.

The building is well lighted and arranged. It is furnished with two upright low-pressure beam engines, one in use and one in reserve. They are supplied with a very economical cut-off, and the boilers are well set and the draft thoroughly regulated by an effective damper, and the consumption of coal is hardly half that at other well-arranged elevators.

WEEHAWKEN TERMINUS.

A branch track starting from the main line just east of the tunnel and running north about three miles (crossing the Delaware, Lackawanna & Western Railroad under grade) leads to the Weehawken docks, on the Hudson River. This property has a frontage of 2,400 ft. on the river and an average width of 900 feet from the present water line, making 50 acres of land, of which 10 acres are occupied by the stock yards and 10 acres by the oil works.

The bulkhead has not been built, and the tracks run to the piers over trestle-work. Altogether outside of the oil works there are 8 miles of track and sidings.

The northernmost pier, 650 ft. long and 70 ft. wide, is covered by a one-story shed used for the transfer of west-bound freight from lighters to cars. South of this is a slip 150 ft. wide and then a pier 680 ft. long and 70 ft. wide, covered by a two-story shed, in which east-bound provisions of all kinds are handled, mostly for export.

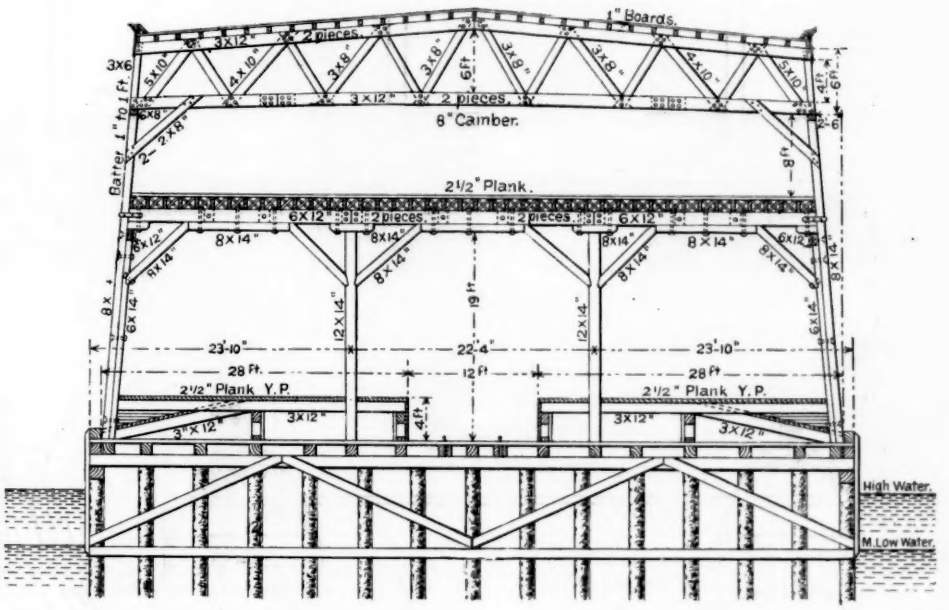
The freight for the second floor (mostly flour in bags) is raised by two endless-chain automatic elevators (patented) like those at the Sixtieth street station of the New York Central Railroad. Here, however, each is worked by a small independent engine. The bags, etc., of flour are delivered to the lighters from the second floor by chutes, which are simply plank troughs suspended at the upper end from an opening in the second floor, leading out of the gangway door and running to the deck of the boat. The lower part is hinged to make it adjustable, and it is all raised and lowered by a block and fall. This appliance saves all labor on the first floor, and is a very simple and effective labor-saving arrangement.

Similar chutes constructed of slats of ½-in. round iron laid in a parabolic curve (steep at the upper end and nearly level at the lower end) are frequently seen in warehouses in the city for lowering all kinds of freight from the street sidewalk to the elevator in the middle of the cellars.

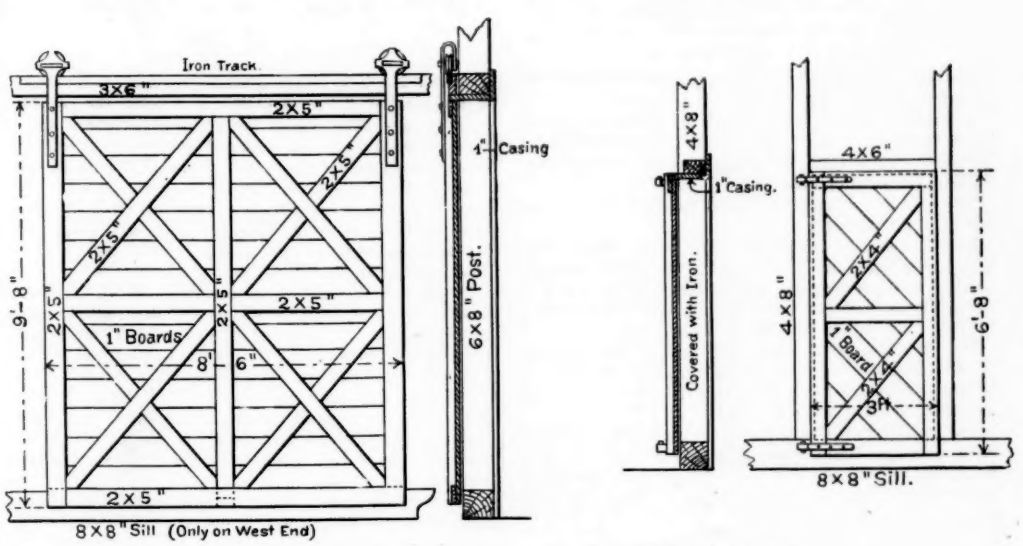
The construction of this shed is shown in the cut of Pier B; the doors are hung and slide on the outside of the building, which is a good arrangement.

South of this pier is a slip 200 ft. wide to a proposed pier not yet begun, 720 ft. long and 80 ft. wide. Facing this slip is a three-story cold-storage provision warehouse. The freight, mostly barrels, is moved by another form of endless-chain elevator (patented), see illustration, which both lowers and raises at the same time. Most of the freight, however, is lowered by chutes.

The cold is obtained by means of hydrated ammonia, and its separation is by evaporation and not by the direct condensation of anhydrous ammonia.



TWO-STORY SHED FOR NEW PIER "B" AT WEEHAWKEN. NEW YORK, LAKE ERIE & WESTERN RAILROAD.



DOORS FOR FREIGHT SHED, PIER 21, NORTH RIVER, NEW YORK.

The business at the oil works operated by the Standard Oil Co. is barreling and shipping oil; there are three piers here.

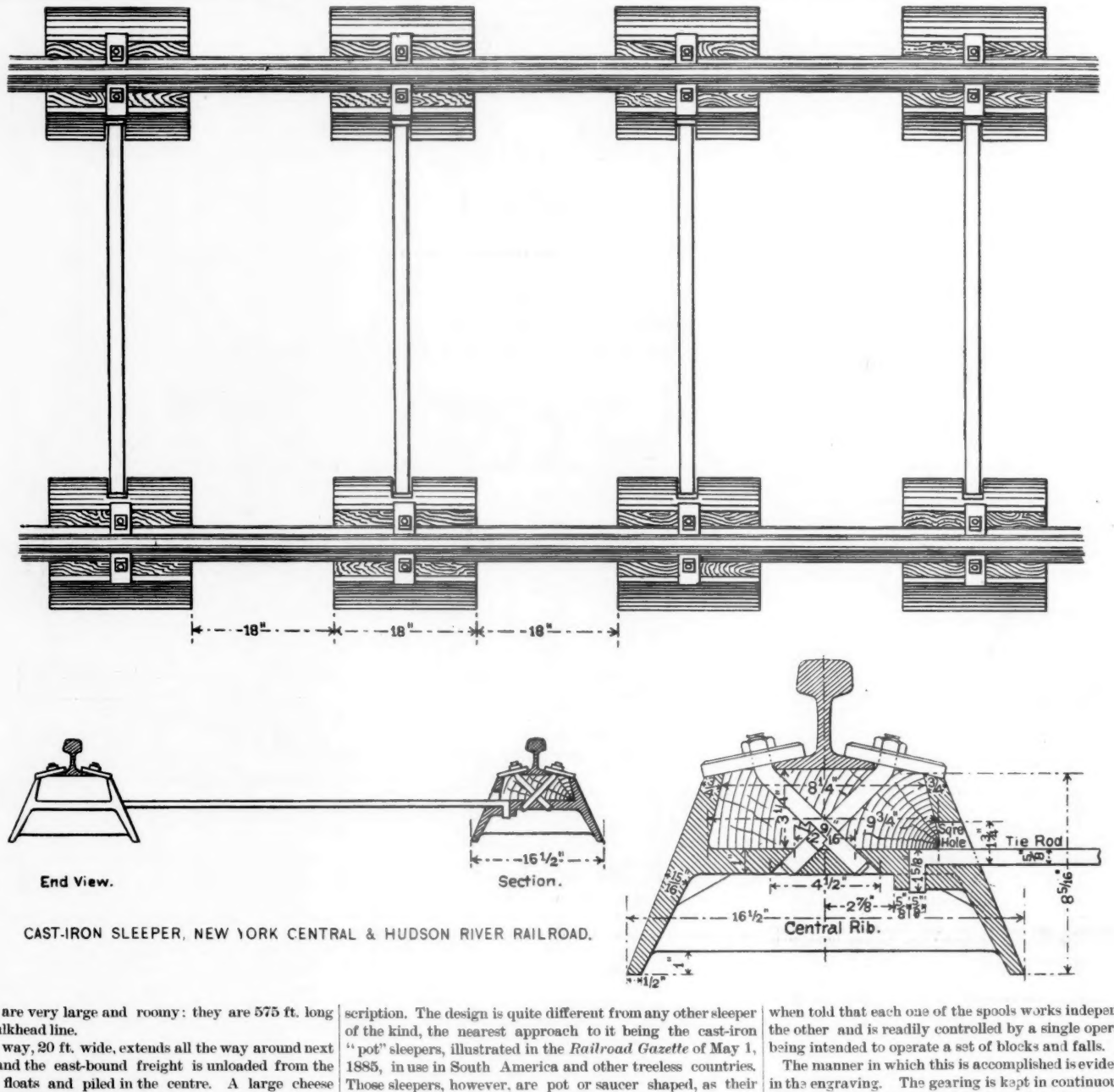
The stock-yards have never been wholly in use, but are located on high, well drained land 400 ft. from the river, and are very well built. Lying adjacent to this property on the north are the coal piers of the Delaware & Hudson Canal Co., and on the south those of the Pennsylvania Coal Co., and, in fact, all the piers at this station are operated by independent corporations and firms, and the railroad company only moves the cars. There are three engines employed here and in running to and from Bergen yard, moving between 250 and 400 cars of all kinds a day each way.

IN NEW YORK CITY.

Flour Pier on East River.—This is next to the New York Central & Hudson River Railroad pier, a third of a mile north of the Battery. It is a narrow pier covered with a shed, one half of which is used for a roadway and one half for storing flour. The freight is moved to it in lighters and barges.

General Freight Station on the Hudson River is at the foot of Chambers street, 1¼ miles north of the Battery. The freight sheds here have a frontage of 400 ft. on West street, as there are two piers, each 100 ft. wide at the bulkheads, with a slip 200 ft. wide between them.

The construction of the sheds is shown in the illustration. They are well lighted and kept neat.



CAST-IRON SLEEPER, NEW YORK CENTRAL & HUDSON RIVER RAILROAD.

The piers are very large and roomy: they are 575 ft. long from the bulkhead line.

A wagon way, 20 ft. wide, extends all the way around next the water, and the east-bound freight is unloaded from the cars on the floats and piled in the centre. A large cheese business is carried on here.

The west-bound freight is hauled partly on the piers and partly on the bulkhead.

There is a floating sorting shed, 50 ft. wide, along the whole length of the bulkhead, 200 ft., which breaks the difference in level between the floats and the bulkhead, caused by the changes in tide and load. This floating shed is in addition to the receiving shed, 50 ft. wide, on the bulkhead.

The weighing of west-bound freight is done on small movable platform scales, which are run to the dray, and the freight is weighed alone, and not on a hand truck. The total covered area is 124,500 square feet.

The Twenty-third Street Station is about three miles north of the Battery. This is a pier about 150 ft. long and 50 ft. wide, used for shipping west-bound freight from the up-town manufacturing districts. The freight is loaded on barges and rehandled at Jersey City.

WILLIAMSBURG STATION.

The Brooklyn business of this railroad, unlike that of the others, is done by means of car floats. The cars are transferred from the floats over a transfer bridge at the Williamsburgh docks by a dummy engine and run across an important city street to a station. Considerable east-bound freight—vegetables, etc—is delivered here, and the west-bound sugar from the refineries is loaded directly on the cars instead of on the barges. Small lots, however, must be transferred at Jersey City to other cars.

All lighterage is done by this company with its own equipment.

Cast-Iron Sleepers.

The sleeper illustrated, designed by Mr. J. M. Toucey, General Superintendent of the New York Central & Hudson River Railroad, is already largely in use in the New York yard of that company at the Grand Central Station, and is notable as being the first metallic tie which has been laid down in any part of the United States for other than experimental purposes. It is contemplated to extend their use throughout the yard and over the immediate approaches to it, at least, and a large part of the work of substituting them for wooden cross-ties has already been done. We have felt driven to adopt the English term "sleeper" to describe them since they hardly seem to be in any sense a *cross tie*, except that they are cross-tied in the manner shown.

The weight of each sleeper is 130 lbs., or 260 lbs. per pair. Beyond this the engravings themselves are a sufficient description. The design is quite different from any other sleeper of the kind, the nearest approach to it being the cast-iron "pot" sleepers, illustrated in the *Railroad Gazette* of May 1, 1885, in use in South America and other treeless countries. Those sleepers, however, are pot or saucer shaped, as their name implies, which the Toucey sleepers are not. The form shown was adopted for four purposes: (1) To facilitate tamping; (2) to preserve better line; (3) to admit and retain the cushioning block of oak, and (4) to permit the use of the Bush interlocking track bolts, as shown in the cuts.

This last device was fully illustrated in the *Railroad Gazette* of Oct. 6, 1882. It was at that time, and has been ever since, in use in the Grand Central and Albany yards, and elsewhere on the New York Central lines, and, we are told, with increasing satisfaction, especially where used at points where permanency and solidity are the first consideration. The immense traffic passing in and out of the Grand Central yard makes this peculiarly the case at that point, where bad ties or loose spikes are inadmissible, and frequent renewals a serious annoyance.

The interlocking bolts, it may be repeated from our former description, are formed with a slot or shoulder on the side and passed through holes (accurately bored by means of a template-guide), so that one of them is a little in advance of the other, in such manner that the bolts slip in past each other freely, but engage with each other when both are drawn up to a bearing by the nuts. An advantage of the arrangement besides that of its positive grip on the tie is that the removal of the rail is easy without removing the bolts.

It will be seen that the sleeper has a central rib through the middle to prevent longitudinal movement, but the ends are entirely open, so that the ballast can be firmly packed under it with little trouble. Comparing their cost with wooden ties, assuming that they could be made in quantities for 1 cent per pound, the cost of a pair of sleepers only would be $2.60, which, as they are placed 3 ft. between centres, should be reduced one-third to compare with wooden ties, making it $1.73, to which is to be added the cost of the tie-rod and wooden block. The wrought iron or steel cross-ties now so common in Europe weigh from 85 to 175 lbs., a common weight for approved designs being from 100 to 120 lbs.

Bridge Erecting Hoisting Engine.

The sextuple hoisting engine illustrated is a new design recently prepared by Mr. J. S. Mundy, of Newark, N. J., at the request of a leading firm in that line, Baird Brothers, of Pittsburgh, Pa., for the especial purpose of facilitating the work of erecting iron bridges. Why and how it will do it will be evident enough to those familiar with bridge erection when told that each one of the spools works independently of the other and is readily controlled by a single operator, each being intended to operate a set of blocks and falls.

The manner in which this is accomplished is evident enough in the engraving. The gearing is kept in continuous motion, and the spools are controlled by throwing them in and out of gear. They are held at any desired point, and prevented from turning backward by the ratchets. All the shafts are of steel.

The engine has two cylinders, 7 × 12 in., and all the wearing parts have been left large as a safe guard against the severe service to which such engines are sometimes exposed. The frame is separately cast and bolted solidly to the main frame of the carriage.

In addition to what appears in the engraving, the engine is made self-propelling by gearing not clearly shown. It is claimed by the maker that it will run eight miles per hour on any track.

These engines have already been thoroughly tested. The firm above mentioned has four of them in use, and in one instance erected the two trusses of a 250 ft. span in 16 hours on the Whipple bridge over the Ohio River at Point Pleasant, W. Va. They were also used in the construction of the great bridge at Henderson, Ky.; the largest bridge which crosses the Ohio. The latter is a triangular truss, and more difficult than other designs to handle, but the 250 ft. spans were raised complete in from 18 to 20 hours. The channel span of this great bridge is one of the longest in the world, being 522 ft. between centres, and all of it has been handled, we are informed, by these engines with great convenience and economy. Another is in use for the erection of the new Baltimore & Ohio bridge over the Susquehanna River.

This new design is substantially on the principle of the pile-driving and hoisting engines of better known types manufactured by Mr. Mundy, except in respect to the friction drum of the latter. It is obviously calculated to be useful for any purpose where there is a good deal of hoisting to be attended to at once, although especially intended for, and adapted to, bridge erection.

The Seating of Cars for Suburban Traffic.

The closing portion of the last meeting of the Western Railway Club was devoted to the discussion of this subject.

Mr. VERBRYCK had built, a few years ago, one train of suburban cars with double seats facing each other in the middle and side-seats at the ends, in substantially the same style as the elevated railroad cars of New York. The seats were made of woven rattan. They were not liked. The rattan seats were objected to, and particularly the middle seats facing each other; he thought reasonably. Two ladies would

come in and take one of the seats, and perhaps two rough men, half-intoxicated, will sit down on the others, facing them, and their feet interfering with the ladies. He was now building three more of the same kind, except that in the centre of the car he was putting in turn-over seats, which he thought would be satisfactory.

Mr. WILSON had noticed for several years, on the Illinois Central, that everybody rushes to get into the centre seats, instead of taking a side seat, indicating, of course, that they like them better.

Mr. VERBRYCK thought it very likely that most persons prefer to sit facing the engine, but there was a difficulty with them for suburban traffic.

Mr. PATRIARCHE noted that many people cannot ride backward with comfort. Ladies almost invariably object to it. The strength of the feeling is shown by the street cars on some of the lines where the seats face each other. Those facing backward are left vacant as long as there is any chance at all to sit facing the way the car is going. On the suburban cars the seats are very seldom turned over, except where there is a party of four.

Mr. VERBRYCK felt sure that if a vote were taken of all the passengers that ride on their suburban road, they would prefer the seats all to be turn-over seats, and he did not think he should ever build any more in the way the Illinois Central and New York elevated cars are built. As for rattan seating compared with plush, for suburban cars he preferred rattan. It is very easily kept clean and wears well. The cars that his road had running now were built in the spring or summer of 1881, and he had not yet had to repair the first seat, except one cut with a knife. They are very cleanly; there is no chance for vermin to get in, and there is no trouble with dust.

Mr. TRACY had noticed that in the Brooklyn Bridge cars the doors are very wide, and they get people out of them very quickly.

Mr. PATRIARCHE asked if passenger cars for suburban traffic were in use with wide sliding doors on the side, the entrance being somewhat after the manner of foreign coaches; except with the door much wider and sliding. He questioned if such a car would not hold as many passengers as an ordinary coach, and at the same time enable them to enter and leave the car more quickly.

Mr. TRACY had been told by an English gentleman that he was surprised that we did not adopt side-doors, as we could handle passengers so much more quickly. It was when the elevated road started. He was in London, and he said, "Now you will find out how much better our system is; you cannot handle the people with your cars." But he had timed about 200 stops on the Metropolitan road—the time the cars were actually standing still—and they averaged about 18 seconds; and he came home and timed the elevated stops, and they averaged 7 seconds. He had made that statement a good many times, and a good many people have said that he must be wrong, but he was glad to see that one of the heads of the Metropolitan roads lately said that they could not handle the passengers so quickly as we do here. The trouble with that system is in getting the people in and shutting the doors. The average Englishman runs along to a compartment looking for an empty one, and finds some one in it and then runs to another, and then back to the first, and so on. There is always trouble in getting the doors closed, and there they close them very expertly, too. He was satisfied they could not get people in and out of those cars as quickly as with ours.

Mr. VERBRYCK had never had any experience with cars having side doors, but did not think there was any difficulty in getting passengers out of suburban cars, seated as they seated them, as quickly as was possible by any system; but there was a little difficulty with the old style of cars with the narrow aisle, and that was the only objection to them, so far as he knew, for suburban traffic.

Mr. WILSON did not think the Illinois Central would consider for a moment returning to the old cross-wise seats. He thought experience was much in favor of having the end seats lengthwise of the cars.

Mr. ROGAN noticed in the new Illinois Central cars that they had been lowered considerably. They were very easy-riding and comfortable.

Mr. SINCLAIR was brought up on the other side of the water, and used to be a good deal prejudiced in favor of side-door cars, principally because he thought passengers could get in and out of them more rapidly than with the end-door cars, although much impressed with the advantage of the ordinary American coach for ordinary travel; but observation of end-doors on the elevated road and side-door cars on the Long Island Railroad had shown that passengers were longer in getting out of the side-door cars on the Long Island Railroad than from the end-door cars on the elevated. Hence he had come to the conclusion that the end-doors are decidedly preferable; but no doubt it would be advisable, in some instances, to widen the doors a little, as on the Brooklyn bridge cars.

Contributions.

New England Railroad Club—Annual Excursion.

TO THE EDITOR OF THE RAILROAD GAZETTE:

On Tuesday last (Aug. 25), in the midst of more moisture than seemed requisite to the pleasure and comfort of the guests, the New England Railroad Club started on the steamer "Rose Standish" for their annual sailing and fishing excursion down Boston Harbor. The rain did not prevent the party from numbering 170, nor from enjoying the various entertainments of the day, provided by the efforts of the committee, Messrs. J. W. Marden, John Kent, George Peck, Samuel D. Nye and F. M. Curtis. The start was postponed one hour, to 11 a. m., on account of the severity of the storm. Had the morning been a pleasant one there would have been undoubtedly over 300 present.

The first visit was to the Reformatory Institutions on Deer Island, but while on the way there a delicious clam chowder was served, which afforded general satisfaction. Alderman James Smith, who had so kindly procured permission to inspect the Institution, escorted the party to the buildings, where he was met by the Colonel in charge. The inmates were at dinner. Judging from the beauty of appointments, the immaculate cleanliness of all the departments and the orderly appearance of the inmates, this is one of the model institutions of Massachusetts. An hour was very pleasantly and profitably spent here.

On approaching Minot's Light and the outer harbor the swell was quite noticeable, and the anticipated pleasure of fishing had to be foregone, but nevertheless the party thoroughly enjoyed themselves. Mr. Geo. Richards, Master Mechanic of the Boston & Providence Railroad, who has just returned from a tour of the Continent, entertained a portion of the excursionists with the matters of interest which he noted while on his trip, and Mr. J. N. Lauder gathered a pleasant party of some twenty or thirty gentlemen in one corner of the boat, and did much to promote the enjoyment of the occasion. The ladies, of whom there were quite a number, were not neglected, Mr. F. D. Adams being especially noticed as devoting himself to their service.

The following gentlemen were among those present: J. W. Marden, President of the Club; J. N. Lauder, Vice-President: F. D. Adams and wife, J. T. Gordon, Geo. Richards, O. Stewart, John Coghlan, J. T. Chamberlain, Osgood Bradley, James T. Leighton, H. A. Little, Chas. D'W. Gibson, F. P. Barnes, A. G. Barber, F. M. Curtis, G. W. Creamer, Geo. F. Cochnower, Chas. W. Sherburne, Geo. Dunbar, Robt. Johnson, John Kent, I. N. Keith, Henry L. Leach, F. C. Mosely, D. G. Mansfield, Sam'l D. Nye, G. W. Peck, J. A. Pingree, Henry O. Putnam, N. Washburne, D. C. Richardson, J. S. Stearns, Geo. F. Small, James Smith, W. W. Snow, J. S. Silver, Geo. L. Whitney, Grafton Upton and others.

A landing was made at Hotel Pemberton, and while lying at the wharf a magnificent collation was served, enjoyed immensely by all present and reflecting much credit on the committee and the caterer.

After the collation had been served the steamer was headed towards Fort Warren, where the party, under the escort of Mr. J. W. Marden, James Smith and others, were taken into and around the fort, spending some little time in examining the works and the magnificent view of the harbor from the ramparts. On re-embarking the party was headed towards Boston, where they arrived at 5:30 p. m., after a day of great enjoyment only prevented from being perfect by the weather, which was remarkable for the uniformity and amount of the rain. Reeves' band of 24 pieces had helped much to enliven the occasion.

The Club is composed of railroad men and those interested in railroad matters, and while its object is the advancement of railroad mechanics and economy, the members believe that a little "let-up" now and then is relished by the best of men, and they hope to continue this feature of the Club; this being the third excursion the Club has enjoyed during its existence of three years. Much interest has been taken in its affairs throughout its entire existence. It now numbers some 150 members, and seems to enjoy unusual prosperity. Mr. F. D. Adams was its President for the first two years, succeeded this year by Mr. J. W. Marden. N. E.

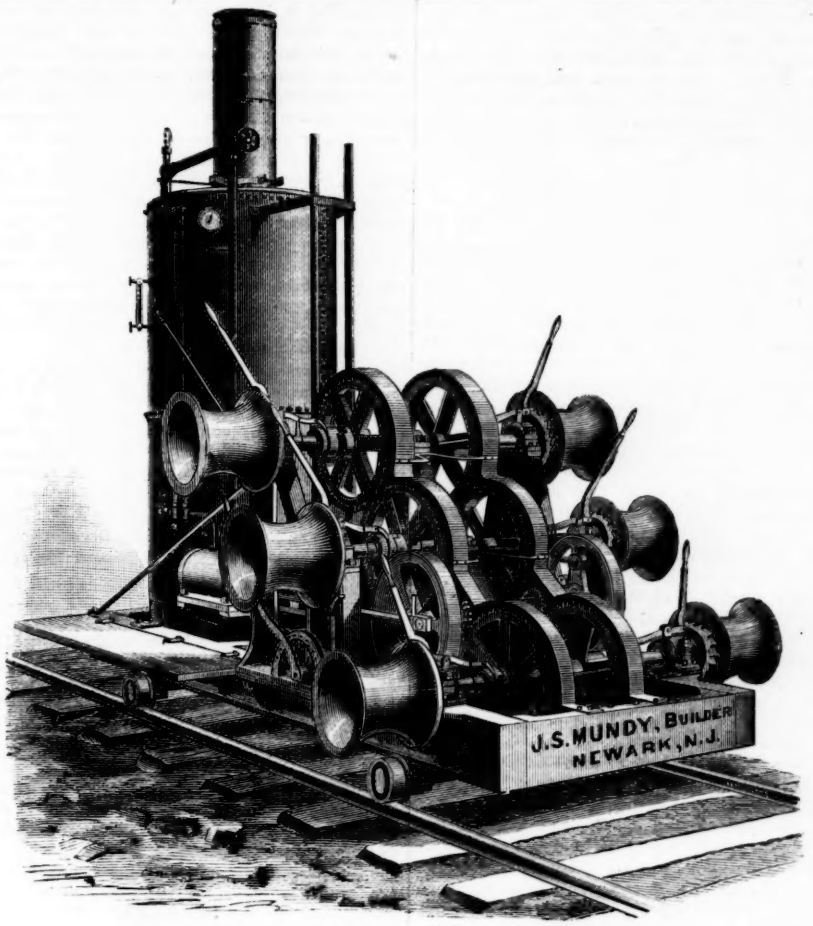
Nuts on the Inside of Rails.

MAHANOY CITY, Pa., Aug. 26, 1885.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice a curious disposition of the track bolts (of the angle bars) on the Mahanoy Division of the Philadelphia & Reading Railroad, between St. Nicholas and Gilberton, and that is, the nuts are on the inside or gauge side of the rails. This is certainly an innovation, and I am curious to know what is claimed for the arrangement. Perhaps you or some of your readers can enlighten me. ANGLE BAR.

[The practice is new to us. A possible reason would seem to be the convenience of track-walkers.—EDITOR RAILROAD GAZETTE.]



BRIDGE ERECTING HOISTING ENGINE.

Why Do Angle-Plates Break?

TO THE EDITOR OF THE RAILROAD GAZETTE:

The recent discussions relative to angle-plate splices seem to have excited considerable interest, and indeed it is a very important question and one to which too much attention is not likely to be given. The various opinions expressed have been read with much interest, but viewing the question from the stand-point of a practical trackman, I do not think the cause for angle-plates breaking from the top has been correctly assigned. I am of the opinion that an angle-plate will rarely, if ever, break until it is first surface-bent, or, in other words, bent down near the middle of the splice, where it is hammered by the wheels in passing. After this bending occurs, the splice is liable to be broken either by the spring of the rails tending to straighten the splice, as would be the case on trestles or bridges where low joints are not apt to occur, or, more commonly, by the trackmen in raising low joints.

To this latter operation I attribute most broken splices. The splices becoming bent, naturally tend to make a low joint; or, *vice versa*, a low joint tends to bend the splice, and as soon as the track repairer puts his jack under the joint to raise it, he begins to exert a powerful force which tends directly to straighten the splice, and in so doing to break it from the top If the splice happens to be strong enough to resist fracture, the adjacent rails will necessarily have to bend at the ends to conform to it; and thus strained, they tend to break the splice. But a badly bent splice usually breaks when the joint is raised, and the "pop" can be distinctly heard when the fracture occurs, although the crack is often so slight as not to attract the foreman's attention, and hence it is a difficult matter to get section-foremen to appreciate the importance of paying strict attention to this matter and to promptly replace any broken or badly bent splices.

The short angle-plate for a suspended joint is probably the most universally adopted splice at the present time, but I am decidedly of the opinion that a better one should be adopted as a standard, and that the standard splice should call for a tie *directly under* the joint, as long as this remains weaker than other parts of the rail. Any one who has ever attempted to surface track knows what it is to be bothered with the short downward "kink" at the ends of the rails when suspended joints are used, on other than the best ballasted track; and I contend that it is next to impossible to properly surface a bad low joint unless the power to raise it can be applied directly under the connection, and a tie left there to hold it in position. The splice recently illustrated as the standard on the Michigan Central comes nearest to the requirements for such a standard of any I have seen, and it would doubtless be interesting to many of your readers to know the success of this new departure.

In adopting a standard, the most expensive, if the best, would doubtless prove the cheapest in the end, as an inferior splice is the source of a great amount of trouble and expense. In the first place, they are constantly breaking, which is not only the cause of considerable expense, but is liable to be the cause of wrecks or derailments; and again, in not

affording sufficient stiffness to the joints, they are the cause of extra wear and tear to rolling stock as well as constant complaint from the traveling public, on account of a rough-riding track. Hence, it is to be hoped that in the progress of the times something better than anything now in general use may be suggested and adopted, and that the best material may be used in its manufacture instead of the poorest scrap as is too often the case at present. ENGINEER.

Basis of Pay for Use of Foreign Cars.

TO THE EDITOR OF THE RAILROAD GAZETTE:

"E. Y.'s" letter in your issue of Aug. 14 is the most refreshing sign of life in the demurrage discussion I have seen, and the first one I have seen for some time. If my communication of July 10 was the means of calling him out, my object was accomplished, and the fact that his scathing remarks had such a powerful tendency to make me feel like crawling into my hole and pulling the hole in after me, is a mere incident.

I have to confess that I had not read the full report of that committee's conclusions, and I also own up to the usual chronic laziness which keeps me from figuring out the statistics which "E. Y." wants exhibited; but with all due respect for the car accountants, does not the fact (acknowledged by "E. Y.") that they have had great difficulty in arousing the interest of their superior officers tend to show that some other way of awaking that interest is needed? Perhaps some unexpected flank movement in the direction of the Time Convention might touch just the right spot.

I think the committee's report, as published by you, peculiarly clear, logical and valuable, marking a distinct advance toward the solution of the question; and yet they seem to lose sight of one point which is deemed by many as important, and that is the principle that the most profitable service a freight car can be in is the carrying of goods on the road of its owner. I hasten to assure "E. Y." that this does not originate with me, principles being founded in the nature of things, and not resting on a mere letter of the alphabet, even if it be the first one and strongly braced, so as to support a heavy load at its apex.

In charging for cars by the day, the fair and simple rule would seem to be to collect from the party who enjoys the benefit of the car, whether it be shipper, consignee or foreign railroad, and there could be no justice in exacting such a charge from consignees at distant points, *through foreign roads*, unless the same were enforced against consignees at home, dealt with directly. "E. Y." will see, if he looks again, that I considered the question chiefly in the light of the *fact* that cars do spend too much time in unprofitable idleness, and with a view to get pay for this wherever the car may be, *at home* or abroad. When a car is running it is wearing out; when it is standing it is "rusting out," and its owners want pay as much for one kind of deterioration as for the other; and no reflecting person will, I venture to say, consider the cost of keeping the accounts as an argument of consequence against the reform. The apprehension that car accountants may get their thoughts too firmly fixed on the debit and credit with foreign roads and on the clerical labor phases of the problem must be my apology for speaking a second time. A.

Is Rock Ballast the Best?

TO THE EDITOR OF THE RAILROAD GAZETTE:

The general impression with railroad men is that stone ballast is in every way superior to any other kind. In keeping with this idea goes the belief that rigid track is very desirable. Both of these ideas seem to me to be altogether wrong. Almost every one with whom I have conversed seems to have a not very well defined belief that ballast is used to make the material on which the ties rest more rigid, so that the tie will not yield. In other words, they seem to think that if we use stone it distributes the weight transmitted from the tie over more surface, and hence the tie will not yield so readily. This is certainly a mistaken belief. Ballast is necessary solely for the purpose of drainage. There is no form of material that will not hold up a heavy traffic, when ties are only 2 ft. apart, provided we can take all the water from that material, but as this is manifestly impossible with many kinds of soil, we have to introduce under the ties gravel, sand, cinder or stone, simply to avoid the absorption and retention of water.

The tie works up and down, and often sufficient water is pumped from the surrounding material, mud is formed and the tie rapidly settles.

It is only a question of time for the mud to work itself up through the ballast and show, with what are known as "pumping ties." It then becomes necessary either to take out the ballast and clean it, or else to raise the track higher by means of new ballast. It will be found that the amount of ballast lost annually by sinking into the road-bed bears an inverse ratio to the amount of money spent on drainage. Hence we see the importance of digging our ditches sufficiently deep to admit not only of draining the ballast itself, but also a portion of the material underlying the ballast.

As for the rigid track base, this seems to be one of the worst fallacies believed in by trackmen. This belief arose from seeing that mud would not hold up a tie. When, however, the water was drained therefrom, it was apparent that the material was more rigid or solid and that the tie held up better. Hence the conclusion was quite naturally jumped at, that the more rigid the supporting material the better would be the track.

Of course the springs relieve the rail of a part of each shock; but they do not take up all of it, and no track will ever ride very easily until there is some elasticity in the track itself. As tending to prove this, I will call attention to the statement made by Chief Engineer Becker, of the Pittsburgh, Cincinnati & St. Louis Railway, that splice-bars break worse on bridges than they do on stone ballast. Many others have noticed this fact. It is also the universal belief that splices break less often on gravel ballast than on stone. Besides every man directly in charge of track with heavy traffic knows that it is necessary every few years to raise his track somewhat, or else to take the ballast from the track and replace it, or his track will become too rigid and ride very roughly. On the Richmond & Petersburg Railroad a few years since, they had a gravel ballast in which there was some kind of cementing material. At first the track seemed to be almost perfect. At the end of two or three years the ballast became very rigid, and notwithstanding that the rails and ties (all being well tempered and having apparently the same bearing) were new, the track became very rough, so far as riding over it would show. At last it was decided that there was too much solidity to the road-bed, and the material on the sides and under the tie was disturbed and broken up. After this was done, it was a common thing for railroad men riding over the road to note the great change in the movements of cars and ask if new steel had not been laid.

I have been told that the Lake Shore Railway had one place at which for some distance the track passed over solid stone. It became necessary after a while to insert between two and three feet of some yielding material between the ties and the rock road-bed. Finally, the *Railroad Gazette* is responsible for saying that the joints and rails are worse on the elevated railroad of New York than they are for any surface railroad, considering the money spent in trying to make them perfect.

With respect to the relative merits of stone and gravel ballast, it is necessary to notice a statement by Mr. Becker, that splices break worse on gravel ballast than on stone, which, however, he states is contrary to what he would naturally expect. Unfortunately I have not had opportunity to walk over the track about which he makes this statement, but I have walked over portions of the West Shore Railway, on some portion of which gravel is used, and over the Philadelphia & Reading, the Philadelphia, Wilmington & Baltimore, the New York Division of the Pennsylvania, the Hudson River and the Pittsburgh & Lake Erie. These roads, in comparison with some others in the country, hardly know what broken splices are on the portions where gravel ballast is used. It is quite probable that Mr. Becker's observations were made on one road, and that some local cause, such as a lack of drainage, or a poorly designed splice, or poor material in it, caused it to appear that splices broke rapidly on gravel ballast.

If in tamping a tie with sand or gravel ballast, one tie is given a more rigid bearing than another, under the action of passing trains the gravel will yield and all ties will soon have an equal bearing. I have stood by the track and watched little streams of sand passing from under a tie that was tamped too hard, and have seen the reverse action take place when a tie was not resting on the bed securely. With stone ballast, if one tie is given a harder tamping than another, it will retain its more rigid bearing for a long time. It is therefore quite important to use a ballast that will make up for defective tamping. It is an exceedingly difficult matter to tamp stone ordinarily used for ballast so as to cause each tie to rest securely on its bed. Only those who have tried it know the trouble involved, but the dust from sand or gravel ballast is so objectionable that most roads prefer to have stone. By the employment of stone ballast we increase the necessary track force, we considerably decrease the life of rails and wheels, and correspondingly increase the danger arising from their breakage.

This statement will no doubt seem strange to the advocates of stone ballast; but any man who will walk over the New York Division of the Pennsylvania Railroad will see that there are more short kinks in the rails and that joints are more out of line and surface where stone is used than where the ballast is gravel. It would be quite interesting if some one would give the relative number of broken splices on sand and stone ballast on this road.

With stone ballast also the noise of a moving train is greatly increased, detracting from the comfort of passengers and increasing wear and tear. The question arises, Why should dust necessarily accompany gravel ballast? In breaking stone with a crusher it has to be screened. Why not screen or wash gravel ballast? On roads where gravel ballast is plentiful, we could obtain screened or washed ballast considerably cheaper than stone.

Whether gravel free from dust would ride as smoothly or be as capable of being tamped remains to be seen. I should hesitate to use it on heavy grades and curves until a satisfactory trial was first made, nor should I expect good results from it without better facilities for drainage than are at present found on some of our best roads. If some road where gravel is plentiful would try this experiment and it should prove successful, it would save much on the first cost of ballast and certainly it would add greatly to the life of rails and wheels and of ties and splices. Of course some roads cannot obtain sufficient gravel and must always use stone.

Any kind of ballast will eventually become packed and need to be taken from the track, shaken up and replaced. The kind of ballast used, as well as the character of the sub-grade material, and the facilities for drainage, will determine how often it is necessary to disturb the road-bed.

Perhaps stone broken very finely by hand will act much like gravel or even better. It would seem to well warrant a trial, especially in places where gravel is scarce.

R. R. B.

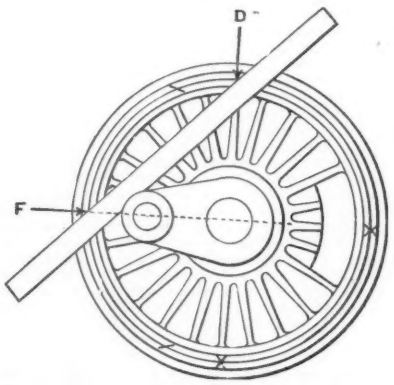
["R. R. B." appears to forget the most important merit of stone ballast from an economic point of view, that it "stays put" immensely better than sand or gravel, and hence does not require resurfacing nearly as often. A little extra trouble and expense in putting it up can therefore well be afforded. As for its alleged effect to increase wear of rails and wheels, we know of no evidence to support "R. R. B.'s" theory, and doubt if it is sound. Gravel ballast, *newly surfaced*, gives as fine a track, it may be admitted, as can be obtained, but gravel track six months old does not make as good a showing, nor have we observed any material difference in noise between the gravel and stone ballast on the New York Division of the Pennsylvania Railroad.—EDITOR RAILROAD GAZETTE.]

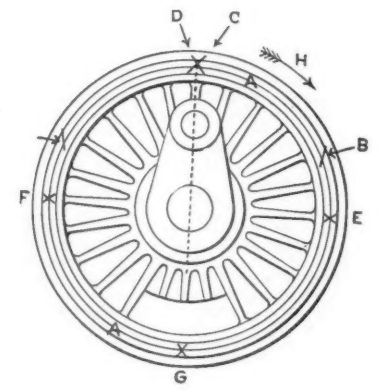
Setting Cranks at Right Angles.

TO THE EDITOR OF THE RAILROAD GAZETTE:

There are still some railroad shops in England in which the quartering machine is unknown, and where lines are depended upon to set the cranks at right angles. The old method of doing this is very faulty, on account of the short length of the lines that were marked on the face of the crank, which made errors very probable, and as a result the method now employed is that described with reference to the accompanying illustrations, which is as applicable to wheels receiving the crank-pins direct as it is to the outside cranks used on inside-cylinder engines.

But little consideration is necessary to demonstrate that the only way to obtain really true or practically true work is to bore the crank-pin holes after the wheels (or the outside cranks, as the case may be) are forced on their axles, because if they are bored before, and at a second chucking in the lathe or boring machine, the alignment of the crank-pin and





the wheel-bores will depend upon the accuracy of this second chucking, which is not a very easy job.

Then the wheels have to be put on their axles, and tests will readily show that not many wheels go on absolutely true. But if the crank-pin holes are bored after the wheels are on their axles, the truth depends upon that of the quartering machine, and is therefore assured. The process of setting the wheels or of testing them after they are on their axles is as follows:

Referring to fig. 1, the circle *A A* is drawn from the centre of the axle. Then from the centre of the crank-pin two short arcs *B B* are drawn; from the points of intersection of these arcs with the circle *A* as centers, arcs *C D* are drawn, giving a point in line with the centre of the crank-pin and that of the axle. From this point arcs *E F* and *G* are drawn, dividing the circle *A* into four equal divisions.

A similar process is performed upon the other wheel, dividing it also into four quarters, one of which is in line with the crank-pin and axle centres.

In putting the wheels on their axles, it is to be considered whether the right or the left-hand crank is to lead. Supposing the direction of revolution when running forward to be that of arrow *H* in fig. 1, then if the left-hand crank is to lead, the crank of the left-hand wheel will require to stand in the position shown in Fig. 2. A straight-edge is then fastened to each tire, its edge being set fair with the two points *D E* on the one wheel and *D F* on the other, and when these two straight edges stand parallel one to the other, which may be sighted by the eye, the cranks are at a right angle.

If the right-hand wheel is to lead, the crank in fig. 2 would require to stand on the other side, the wheel being given half a revolution, and the straight edge on that wheel must be applied to points *D F* on both wheels.

The main element of accuracy in this process lies in this,

that the test extends through the full length of the straight edge instead of being confined to the length of the crank only; hence any error is greatly magnified.

JOSHUA ROSE, M. E.

Electric Railroads In Practice.

Considerable skepticism still exists as to the successful application of electricity to the propulsion of railroad cars. There is a substantial reason for this, as it has been far easier to demonstrate on paper its advantages for this service than to actually introduce it as a substitute for direct-acting steam or horse-power. Admitting that such advantages exist, there are still sufficient differences of opinion as to the merits of various systems to account for the apparent delay in permanently adopting any of them. A thorough equipment of this character is not only originally expensive, but when once laid down it should remain, and for this reason, if no other, the best should be secured. There are no doubt many people who believe that the only preparation essential is to provide the required conductors, place a motor on a car, belt it to the axle, establish a dynamo plant at a convenient station, make the necessary connections, and "let her go." That might be putting matter in motion, but it would not necessarily constitute an efficient railroad service; and taking the New York elevated railroads as a criterion, the supplanting of the present operating system is no child's play. A motor which is perfect in every other respect, but is given to occasional fits of jumping the track, will not do, no matter how economical its operation may be. In the light of past experience it appears somewhat doubtful if a line already taxed to its fullest carrying capacity is the proper place to demonstrate the feasibility of an experimental system, not because it is unequal to the work, but simply for the reason that minor defects in such cases lead to serious results. Fifty years of steam locomotion have been necessary to the development of the modern railway. To suppose that this accumulated experience is to be heedlessly brushed aside, and that the electrical engineer, trained in another school, is to immediately provide a satisfactory substitute, is the height of absurdity.

The popular idea of a railroad operated by steam is a track, made up of iron or steel rails, over which trains of cars are hauled by locomotives. This is the final outcome of practical experience.

The electric railroad, which has barely emerged from the guidance of its numerous inventors and exploiters, already exists in various forms, all of them being more or less crude. There are the overhead, the side and the subterranean conductor, in all of which the current is derived direct from a dynamo; then there is the self-contained principle, in which the current is supplied by a storage battery carried on the car. The latter system is intended more especially as a substitute for horse-cars. One inventor merely substitutes an electric for a steam locomotive, while another makes a motor of each car. Furthermore, no inventor appears to entertain proper respect for the systems advocated by his rivals.

One of the greatest drawbacks to a new branch of electrical industry, looking from a financial standpoint, is the continual march of improvement, forcing upon the management not only the adoption of new devices, but the actual abandonment of the apparatus which is superseded. This has been the experience in both the telephone and electric-lighting fields, and there is no reason for believing that the electric railroad will be an exception, especially as there is already a wide divergence in opinion as to the most desirable plan. While we have perfect confidence in the future availability of electricity as an economical method of applying power, it must be intelligently used. Its advantages can and will be demonstrated, and the various practical tests which are now being carried on in this country as well as in Europe will eventually be crowned with complete success.—*Electrician and Electrical Engineer.*

TECHNICAL.

Locomotive Building.

The Manchester Locomotive Works in Manchester, N. H., are building 6 locomotives for the New Brunswick Railway.

The Baldwin Locomotive Works in Philadelphia have recently received several small orders, and are working about the same force as for a year past.

The Pittsburgh Locomotive Works have just completed and shipped a new locomotive for the Jacksonville & Atlantic road, in Florida.

The Car Shops.

The LaFayette Car Works in LaFayette, Ind., after a month's stoppage, have resumed work on three-quarter time.

The Terre Haute Car Works in Terre Haute, Ind., are building 25 refrigerator cars, to carry dressed meat between St. Louis and New York.

The Chicago, Rock Island & Pacific shops in Chicago are equipping 400 freight cars with air brakes. These cars are to be used on fast freight trains.

Mr. A. S. Whiton, of No. 115 Broadway, New York, has sold to the Cape Fear & Yadkin Valley Co. the iron-work complete for 50 freight cars, which are to be put together in the company's shops, at Fayetteville, N. C. Lumber is cheap there, and labor is no higher than in Pennsylvania or New York.

The Peninsular Car Works in Detroit, Mich., have an order for 300 box cars for the St. Joseph & Grand Island road.

The Indianapolis Car Works in Indianapolis, Ind., are building 100 stock and 100 flat cars for the St. Joseph & Grand Island road.

Iron and Steel.

The Lickdale Iron Co. has been organized at Lebanon, Pa., to manufacture iron and steel. The capital stock is $100,000.

Furnace No. 3 of the Crane Iron Co., at Catasauqua, Pa., has gone out of blast and is to be rebuilt.

The new Columbia rolling-mill at Columbia, Pa., is nearly completed, and will probably be started up during the present month. The mill is equipped with the latest and most improved machinery.

One stack of the Coleman furnaces at Cornwall, Pa., has gone into blast and the other is being repaired, with the intention of starting it up as soon as it is ready.

Manufacturing and Business.

We are informed that the statement made last week, on what appeared to be good authority, to the effect that the St. Paul & Northern Pacific Co. was purchasing tools for its new shops, is not correct. The entire equipment of tools and machinery for the new shops at Como (not Bishop), near St. Paul, was contracted several months ago with Messrs. Manning, Maxwell & Moore, of New York, under the supervision of Mr. George W. Cushing, Superintendent of Motive Power, who will have charge of the new shops when finished. Mr. Cushing has entire charge of the construction and equipment of these shops and intends to make them a model in every particular. The company has recently contracted with the Edison Co., of New York, for the installation of its system of electric lighting for the entire premises.

Messrs. Kolesch & Braasch have established themselves at No. 88 Fulton street, New York, for the purpose of selling drawing materials, engineers' and architects' supplies, etc. They will be represented by Mr. Anthony J. Schindler, formerly with Keuffel & Esser.

The Rail Market.

Steel Rails.—A decided advance is reported and small lots are now quoted at $28@$29 per ton at mill, and sales of two lots of 5,000 tons each, at $29, are noted. Some small lots of light rails have been taken at $30@$32. Several large orders are on the market, but negotiations are not closed. A reported sale at $26 by the North Chicago Rolling Mill Co. is contradicted.

Rail Fastenings.—Quotations still continue nominally at 1.80@1.90 cents per pound for spikes in Pittsburgh; 2.40@2.80 for track bolts, and 1.60@1.70 for splice-bars. Trade continues very dull, however, with sales mostly on private terms.

Old Rails.—The supply of old iron rails is reported light, but the demand is also light and the market not at all active. Quotations vary from $16@$17.50 per ton at tide-water. Old steel rails are quoted at $16.50@$17.50 per ton in Pittsburgh.

Railroads in Honduras.

The survey of the projected line across Honduras has been completed for about half the distance, from Truxillo to Jutecalpa, a distance of nearly 200 miles. The entire line is to extend from Truxillo on the Atlantic coast, through the central portion of the country, to the Bay of Tosaca on the Pacific coast. The road is expected to have a considerable traffic in cattle, which are raised in large quantities in the interior, and in valuable woods, such as mahogany, rosewood, ebony, etc. The concession for the construction of the road was granted to a New York syndicate, of which Colonel M. L. Aguilera is head. Mr. W. W. Hungerford is chief engineer of the road, and will have charge of its construction.

New Pullman Cars.

Three new Pullman sleepers, surpassing in elegance all former productions of the kind, have just been built for the route between Boston and Washington, over the New York & New England, the New York, New Haven & Hartford, the Pennsylvania, the Philadelphia, Wilmington & Baltimore, and the Baltimore & Potomac railroads. One of them, the "Ticinus," was inspected yesterday afternoon by a party of railroad men and journalists in the New York & New England yard, at the foot of Summer street. The general arrangement of the car is like its predecessors, but it differs in decoration. The finish is mahogany, and in place of the marquetry on the upper berths, there are oval panels of embossed old gold plush. The seats are broader than usual and the backs higher, with a depression for the shoulders and a support for the head. Both lower and upper berths have electric bell knobs. The prevailing color is the present æsthetic craze of "yallery-greenery." The ceilings are decorated with a combination of gold and silver, mottled in the panels, which resembles bronze. In the state-room the washstand has a roll top, like desks. The smoking and toilet rooms show slight improvements. Beveled mirrors between the windows and at the bulkheads, mounted in antique brass frames, add to the luxurious effect. The buffet is supplied with every essential for luncheon. The car is 65 ft. 2 in. long, and is mounted on 42-in. paper wheels and the easiest springs ever used.—*Boston Advertiser, Aug.* 27.

Large Steel Castings.

The notice in the *Iron Age* for Aug. 6 of the 27,000-pound open-hearth steel casting turned out by the Standard Steel Casting Co., of Thurlow, has attracted the attention of other manufacturers of steel castings. Mr. Joseph Morgan, Jr., Chief Engineer of the Cambria Iron Co., has sent us some data relating to large steel castings made at Johnstown by the works under his charge: "Three years ago we made a gear-wheel which weighed 24,000 pounds, finished weight, and it was duplicated two years ago. Six months ago we poured two roll castings taking 30,000 pounds each, or about 27,000 pounds after the sink-head was cut off. These castings were turned throughout, showing perfect solidity and great toughness. We are now at work at the 40-in. blooming train. We have the ability to make a casting up to 25 tons rough weight."—*Iron & Steel Association Bulletin.*

Small Steel Plants.

The rage for "baby" Bessemer plants seems to be spreading abroad. In our country 4-ton converters are, even for the Clapp-Griffiths process, considered the most suitable in size. There 1-ton and 2-ton vessels are finding favor. An interesting piece of work is going on at the Stenay and the Traisans works, where Clapp-Griffiths plants have been running successfully on Bessemer pig for more than 8 months, producing an excellent metal at figures which, it is said, rival those of the ordinary acid process. At the same time, the Stenay Works have put in a Walrand-Delattre plant, treating also a higher class of pig. This plant has been duplicated at the Hollerich Works, where it is being used for the purpose to which it is best adapted, the treatment of phosphoric pig. The Walrand-Delattre process has great similarity with that of Harmet, tried years since at Creusot. It consists in blowing till the elimination of carbon and silicon in an ordinary acid-lined converter, and performing the after-blow for the removal of phosphorus in a second vessel, lined in this case with magnesia. An engineer who witnessed a blow at Hollerich states that the work on the first converter took 13 minutes, and that it required only 4 minutes to eliminate the phosphorus in the second vessel, which, by the way, was charged with 7 per cent. of lime. The charge was only 1.5 tons, but the heat was ample, and the waste 18 to 19 per cent., or about as much as the basic process under ordinary conditions would show. It is reported that continued working with these two vessels dispelled the doubts generally held as to the practicability of the system, and the metal itself proved to be of excellent quality. On the latter point metallurgists will have little doubt, since the records of working with the basic process have proven the matter. While on the one hand the extra handling of the steel seems to involve mechanical difficulties of no mean order, the matter comes down finally to the question whether the money value of the improvement in the quality through the elimination of phosphorus counterbalances the extra cost of an after-blow in an extra vessel, the wear and tear of which cannot be great.—*Iron Age.*

The Fastest Tunnel Driving.

Last July, O'Brien & Clark, contractors on the new Croton Aqueduct tunnel, offered a prize of $300 to the gang making the fastest record for the month to Aug. 15, and $200 and $100 as second and third prizes, the Rand "slugger" drill and the Rand air-compressors being used. Progress was determined as follows: A run was made as nearly uniform as possible of both bench and heading. When the bench exceeded the heading, 4 ft. of bench was counted equal to 3 ft. of heading. The foremen winning the premiums were at liberty to distribute them among their workmen as they saw fit.

The 24 miners, working in gangs of 12 at a time, who made the best record, drilled and cleaned 254 ft. of heading 8 × 8 ft. within the month, which is claimed to be the fastest mining work ever accomplished. The tunneling was through hard trap rock.

Western Society of Engineers.

The 214th meeting was held in the Society's Hall, Chicago, Aug. 18, Mr. A. Comstock in the chair; Mr. Liljencrantz Secretary *pro tem.*

Several applications for membership were received.

Mr. A. W. Wright, for the Committee on Railroads and Transportation, submitted a communication in reply to Mr. T. J. Nichols' questions relating to the comparative economy and capacity of Standard and Narrow Guage Railroads, and to the most economical section and weight of steel rails under certain conditions. Referred to the Secretary.

Mr. Wright moved that the qualifications, etc., for membership, be printed on the backs of the blanks for application. Carried.

The Librarian called attention to the need of additional facilities for the proper care of the Library, and asked for authority to order a new book-case, submitting design and estimate of cost for the same. On motion it was referred to the Secretary and Librarian, with power to act, and the Society adjourned.

Compressed Air for Propelling Street Cars.

The line of the London Street Tramways Co. from Holloway to King's Cross is about to be worked exclusively by compressed air-machinery instead of horses, as hitherto.

Underneath the car body is a series of cylindrical reservoirs, which may be charged with enough compressed air to propel it a distance of 10 or 12 miles. The car is four-wheeled, one pair of these wheels alone being used for driving; and, to save the expense and inconvenience of turn-tables, the car may be driven from both ends. To the driving wheels are attached a pair of high and low-pressure ordinary working cylinders, each of 8 in. stroke. Means are provided by which the high pressure air can be used in the low-pressure cylinder, if necessary, for starting. The air in passing from the reservoirs to the cylinders bubbles through boiling water and steam of 60 lbs. pressure on the square inch contained in a vessel called the "hot-pot," of which there is one at each end. This vessel is charged at the pumping station during the time occupied in charging the car with compressed air. The advantages claimed in thus using the air are that the heat which the air takes up in passing through the hot water not only causes the air to expand, but prevents the formation of snow in the cylinders at the exhaust. The moisture also picked up by the air in its passage through the hot water acts as a lubricant for the side-valves and pistons.

The working pressure in the high-pressure cylinder can be varied at will; it is usually from 120 lbs. down to 50 lbs. on the square inch, the variation being regulated by a valve of peculiar construction, consisting essentially of a piston, which, by means of a hand-wheel and screw, can be forced into or raised from a vessel in which water and air are contained. The bottom of this vessel is made of an india-rubber diaphragm, which is connected to a valve opening against the pressure of steam and air in the "hot-pot." With this arrangement, when the piston is forced down into the vessel in which the water is contained, the diaphragm is pressed downward, and the valve is opened, allowing the steam and air to escape from the "hot-pot" to the working cylinders. This valve gives the driver a most delicate and beautiful means of varying the working pressure, which, in addition, it automatically regulates. Every precaution has been taken for safety. In the first place, the car can run over nobody. The wheels are hidden from view behind the capacious cylindrical reservoirs which flank all four sides, almost down to the road level. Whatever may get in the way of the car in motion would simply be shunted aside, albeit somewhat unceremoniously. But the car can be pulled up short: the brakes can be applied to all four wheels in any one of three different ways. In the case of excessive speed, as over 10 miles an hour, there is a governor which not only cuts off all steam, or rather the air, from the engines working the car, but applies the brakes. The driver, too, can, from either end of the car, put on the air-pressure brake, and has a foot-brake continually under his control when the car is in motion, with which ordinary passenger stops are made. With the most powerful of these arrangements, and when running at its greatest speed and in ordinary weather, the car can be brought to rest in a distance slightly exceeding its own length. The driver also has the power, by reversing the engines, of rapidly coming to a standstill. The car as constructed carries 38 passengers, and weighs about 6½ tons unloaded. The tramway is regarded as one of the most difficult for the purpose, on account of its varied gradients and a sharp curve in its course, not to mention the fact that the thoroughfare is one of the busiest in London.—*Railway and Tramway Express.*

Progress of Krupp's Works.

The progress of the works of Herr Krupp at Essen continues to be one of the marvels of modern industry. The most recent and authentic data, as summarized in *The Engineer*, show that in 1860 the total number of workmen employed by Herr Krupp was 1,764. In 1870 they had increased to 7,084. At the present time—1885—the total number employed in all the establishments of Herr Krupp exceeds 20,000. If we add the wives and children dependent upon the workmen, the total number of persons supported by the Krupp works is not less than 65,381. Of this number fully 29,000 dwell in cottages built by Herr Krupp and belonging to his works. There are eight separate and distinct departments belonging to this enormous concern. In the first place, we have the vast extent of workshops at Essen; secondly, three coal mines at Essen and Bochum; thirdly, no fewer than 547 iron ore mines in various parts of Germany; fourthly, several iron mines near Bilbao, in Spain; fifthly, an extensive series of smelting furnaces; and sixthly, the ranges at Meppen for the testing of the Krupp guns. Besides the eleven smelting furnaces, there are 1,542 puddling and heating furnaces. The number of steam boilers employed on Herr Krupp's works is 439, and the total horse-power of the 450 steam engines in use is 185,000. There are 37 miles of railroad in the works, on which the traffic is performed by 88 locomotive engines, and a park of 893 freight cars. There are no fewer than 35 telegraph stations, with 40 miles of telegraph wire and 55 Morse apparatus in operation on the works.

The Invention of the Block System.

A correspondent of the *Engineer* claims that Mr. Edward Umbers, a farmer, living in the village of Wappenbury, near Leamington, is the true inventor of the block system [apparently meaning also interlocking apparatus]. The letter says: "He is well known to have had a railway laid on his farm premises, and astonished his friends by his discoveries in connection with signal apparatus. I believe he experimented many years. At last he introduced it to a firm of signal-makers, who took him by the hand, gathered all he knew, then suddenly showed Mr. Umbers an improvement little different, and left him a ruined man after spending several thousands."

RAILROAD GAZETTE

Published Every Friday.

EDITORIAL ANNOUNCEMENTS.

Passes.—*All persons connected with this paper are forbidden to ask for passes under any circumstances, and we will be thankful to have any act of the kind reported to this office.*

Contributions.—*Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to* ALL DEPARTMENTS *of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.*

Advertisements.—*We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay,* EXCEPT IN THE ADVERTISING COLUMNS. *We give in our editorial columns* OUR OWN *opinions, and those only, and in our news columns present only such matter as we consider interesting and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.*

UNIFORM TRAIN RULES.

The task which the members of the committee on train rules, appointed by the last Time Convention, have before them is in some respects as delicate and complicated as that of the Master Car-Builders in the coupler question. They have the same perplexing abundance of material to select from, and, within wider limits, a similar responsibility of rejecting a part, even if it be meritorious in itself. The multitude of wise precepts already formulated and (ostensibly) used *by some road or other*, leaves no excuse for the omission of any important point by a compiler of judgment and experience; for surely such subjects as are not already embodied in good rules cannot fail to be suggested by a comparison of existing codes, so that the committee, being furnished with all the best extant, can supply the deficiency.

The embarrassment of too many good rules arises from the fact that more than enough will be sure to confuse many of the people for whose benefit the rules are made, and hamper every officer who tries, by teaching or training, to weave them into the mental habits of his subordinates. The compilers are somewhat in the situation of the confectioner who has a valuable mass of sweets on the fire, and who must understand the delicate process of crystallization so perfectly as to withdraw the heat at precisely the proper moment, and not waste his labor by doing it too soon, or burn his material by waiting too long. The committee must, for the reason just stated, be careful not to put in a single sentence which will do more harm by complicating matters than it will good by virtue of its own importance; and on the other hand, must not leave out so many points as to tempt individual superintendents to add rules of their own to every chapter and sub-head. It is fortunate that the work is in the hands of men of so high a degree of ability, and it is to be hoped that the work will not suffer from that universal bane of railroad deliberative work, lack of time on the part of the workers.

But whatever may be said about the substance of the rules and of their greater or less value, considered individually, there can be no question that one of the most useful things waiting to be done by this committee is a *rational arrangement* of the different subjects embraced in the department of railroad art under consideration, and the establishment of a respectable and worthy standard as regards expression, language and form, for the guidance of future revisers and as a model to be followed by the multitude of officers, small and great, who express their wishes to their subordinates in all manner of illogical and back-handed verbosity, simply (?) because they are in too much of a hurry to give the matter a little careful attention.

This uniform code is likely to stand for a long time; for even if it be far from perfect, the reason already suggested—lack of time on the part of superintendents generally—will tend to protect it on the score of letting well enough alone, if this consideration can with any show of consistency be applied to the case, and, for this reason, should be most carefully considered in every detail. We have said that a rule may be a source of complication by its own lack of usefulness, or by its mere presence; it is equally true that a rule, good in itself, may be entirely pertinent in one place, and easily grasped by the ordinary mind, while it would be worse than useless in another; so that the simple question of arrangement becomes one of importance. Men fail to comprehend rules because they are not arranged under proper heads, many so-called codes having hardly any sub-heads, general, special and local regulations being thrown together in one jumble; because too many or too unfamiliar words are used, or they are bunglingly put together; or because—and perhaps this is the most common fault—the language is too brief—brevity being greatly admired in railroad circles—perhaps because it seems akin to snappishness, which, tradition says, was in ancient times a prominent trait of railroad officers. We believe much could be learned from the English in the art of expression; they, or at least many of them, stick more closely to the solid Saxon than we do, and, though they often seem to us rather verbose, a combination of English patient painstaking and American directness ought to produce a decided improvement on much of our time-table literature. Mr. E. B. Ivatts, in his recent English work on station management, says the Clearing House Association would not allow him to publish their code; but it doubtless can be made available to our committee.

Codes are frequently somewhat inconsistent, because they are fragmentary, having been put together by different persons, and in many cases being the aggregation of years, without having been revised. Men fail to act as they are expected to act because they do not comprehend the relative importance of different rules; inconsistency of precept being a direct cause of inconsistent behavior.

By establishing a thoroughly logical plan or framework which shall deserve approval, as a basis for the *shape in which to arrange* their rules, the committee can perform a valuable work, for this feature of it can do good even among those who may refuse to adopt the code itself. Quite likely there will be more or less of these, as in the case of uniform whistle signals, etc., but it certainly seems as though everybody with any desire at all for uniformity could be got to agree on a standard skeleton form. There may, for instance, very reasonably be differences of opinion as to whether a certain service shall be required of a station agent or of a conductor; but all ought to join in placing the conductor's rules in one place and the station agent's in another, and in having a recognized place for each; and in an effort to correct the present state of affairs wherein one company treats a certain rule quite carelessly, as though it were a temporary affair, while another places the same among its most imperative requirements, to be regarded on the same level as the laws of the Medes and Persians. It ought to be practicable for the committee, having made common-sense decisions on the various questions of relative importance of different topics, to arrange a code in such a way that those who could not bring themselves to adopt it as a whole would not be tempted to demolish the whole work and return to their own devices, but would find it convenient simply to alter what few objectionable points they should find, without impairing the symmetry or value of the rest or disturbing their position.

And if the committee could contrive on the completion of their work to have it bound up in some sort of an interlocking apparatus, so that it would be mechanically impossible for a superintendent to "fire" the rules at his men without at the same time going personally to see whether or not he had hit the mark he aimed at, their names would deserve to be commemorated on tablets of gold.

IMPERCEPTIBLE SLIP IN LOCOMOTIVES.

Whether or not there is such a thing as "imperceptible" or continuous slip in the driving-wheels of locomotives under certain circumstances has been for a long time regarded as more or less doubtful; to this extent, at least, that there is a wide-spread belief that there is such a thing, supported by not a few alleged records of experimental observation. Mere assertions in support of it, or allusions to it as a well-known fact, exist without number. One such allusion was made at the last convention of the Master Mechanics' Association, and another at a recent meeting of the Chicago Railway Club, both coming from men who might be supposed to know. Of the more definite and positive evidence on the subject, some was given in a letter published in the *Railroad Gazette* of Dec. 14, 1877, which referred to a list of experiments presented to the Civil Engineers' Society of Paris, proving that imperceptible slip did occur, although the conclusion only was republished; that "common locomotives" were "actually unsuited for speeds of 60 to 75 miles per hour," because the slippage was as much as 20 per cent. In the specific instance of the Uetliberg road, it was said that on grades of 7 per cent. (370 ft. per mile; less by 1 per cent. than is now successfully operated in Colorado, and less by 3 per cent. than was successfully operated on temporary lines by the late Benj. H. Latrobe), "the slip of the driving-wheels was found so considerable that the gear system was found more economical," in spite of the slow speed.

In the *Railroad Gazette* of Nov. 2, 1877, appeared a further record on the subject, translated from the *Annales du Genie Civil*, in which the record was given of tests of a fast passenger engine for the Northern Railroad of France, having four coupled drivers, 6 ft. 10 in. diameter, carrying 26½ tons, on a grade of 0.5 per cent. (26 ft. per mile); with good rail and weather, and 121 lbs. per square inch boiler pressure. The report continues:

"Under these conditions the locomotive, which was tested alone (hauling no train behind it), attained a speed on the down grade of 74⅕ miles an hour, corresponding to 303 revolutions of the drivers per minute. Now, the registered number of revolutions was 360, corresponding to 88.8 miles per hour—a slip of 19 per cent.

"Surprised at these results, the writer repeated the same observations on a certain number of locomotives of different types, comparing the speed with the revolutions of the drivers. It was generally found that the slip was slight on an up-grade, but very apparent on a down grade, ranging from 13 to 25 per cent. It increased rapidly with the speed."

This evidence appears pretty conclusive, especially as other articles and paragraphs to the same effect have appeared, if we mistake not, from time to time; accompanied by various reasons why the centrifugal force of the counterweights, and what not, must have the effect of producing it.

Yet it appears to be now well established that, as respects American locomotives, at least, the phenomenon so well certified to has no real existence; and there seem strong reasons to question whether it is theoretically possible under any circumstances, and whether a rather absurd error of observation has not been committed in these alleged experimental records.

As respects the existence of the phenomenon:

In the *Railroad Gazette* of June 14, 1878, the late Prof. Charles A. Smith gave the "log" of a trip of a fast passenger engine (probably 35 to 55 miles per hour at various points) for 220 miles on the Western Division of the (then) Wabash Railway, in which the record of revolutions on mile and 10-mile sections corresponded almost precisely with that required by measurement. A similar test, with a similar result, was made some years later by Mr. Albert F. Hill, on the Cincinnati, Hamilton & Dayton road, and recorded in his "Test of a Baldwin Locomotive," published in the *Journal of the Franklin Institute*. Recently, Messrs. Henry Albey and Oscar H. Baldwin have made, perhaps, the most convincing test of all on one of the high-speed Philadelphia & Reading express engines, whose ordinary working speed is 55 to 65 miles per hour, and at times still higher. The average of 13 readings with a counter which could be thrown in and out of gear instantly, but which could give no fractions of revolutions, was 289.7 revolutions per mile, 298.9 having been indicated by steel-tape measurements of six revolutions. The discrepancy is far too small to be regarded as more than an error of observation, especially as, so far as it goes, it is against the theory. No irregularities were found in any of the single observations at different speeds.

Other tests, which we do not recall, have possibly been made, to the same effect; but the evidence given appears to be enough, under all the circumstances, to warrant the conclusion, not simply that the phenomenon is a rare one, but that it *never* occurs with American locomotives.

There is, however, an undoubted possibility, so far as this evidence alone is concerned, that the phenomenon might not occur with American locomotives, and might occur with differently constructed foreign locomotives; if for nothing more than that the load is equalized on all the wheels in the one case, and not in the other; for when a thing is not inherently impossible, the testimony of even one man that he has seen it occur will justly, as a rule, outweigh the testimony of a dozen that they have not seen it, under seemingly similar circumstances.

But in this case there may seem grave reasons for questioning the physical possibility of the assumed phenomenon as being contrary to what is known in

other ways of the laws of friction. It is a matter of every-day observation, which was confirmed, and in fact first clearly proven, by the Galton-Westinghouse brake experiments, that the difference in friction between rail and wheel when the wheel is rolling on the rail and when it is sliding is very great indeed. Admitting this, it necessarily follows that, if the locomotive be exerting its full power under any circumstances and the wheels once begin to slip at all, the load on the cylinders will be so reduced that the wheels will slip a little faster and hence begin at once to "spin," just as they may be seen to do at any time in any large yard. Captain Galton's tests showed that whereas the force with which wheels resist slip, "imperceptible" or otherwise, is from one-fourth to one-third of the load on the drivers, at 10 miles per hour the resistance falls to one-eleventh, and at 70 miles per hour to one-twenty-fifth of the load. How then is it possible that under any circumstances whatever a wheel can *begin* to slip without the slippage immediately becoming very decidedly perceptible, as it does whenever a train is starting? Yet we have evidence in its favor which would be quite sufficient to establish any ordinary proposition.

But one explanation of the direct conflict of evidence seems possible; and in it, beyond much doubt, we have the true explanation. The alleged slippage probably occurred, but it was in no respect "imperceptible" slip, nor different in any way from the ordinary slipping, which is perceptible enough. It is easy to see how this might occur: When a locomotive is only moving itself, especially if running down a grade, and is having little work to do, and when all possible power is put on to run, in literal truth, "as fast as the wheels can turn," whether the wheels are slipping or not will make no very conspicuous difference in their *speed* of revolution; while, on the other hand, the work required of the locomotive simply to keep up speed will be so small that, when the wheels once begin to slip, the loss of power will not be so great as to prevent the acquirement and maintenance of very high speed, although they will continue to slip indefinitely, nevertheless. On the other hand, with a train of even one car behind the engine, no *high* speed could probably be maintained under such conditions, for the minimum power to maintain the speed would then be so great that the speed would be immediately checked, and make it clear to the senses that the wheels were slipping.

Suppose, when the wheels of a freight engine were slipping, that the engine were simply uncoupled—instead of shutting off steam in the usual fashion. If the grades were not too unfavorable, the engine would probably start ahead, the wheels still slipping, and if all steam were put on, on a favorable down grade, a velocity of "74½ miles per hour" might possibly be obtained, with an "imperceptible slip" of 20 per cent! These are probably the conditions, and the only conditions, under which the phenomenon has ever been observed. They correspond to nothing in the worst extremes of practical operation; therefore the phenomenon, as an incident of practical operation, may be regarded as nonexistent. The only thing really proved by such "tests" is that even when the wheels are slipping in ordinary fashion they will kick hard enough against the rails to make an unloaded engine move down a grade at a very lively pace; which illustrates how easy it is to draw wrong conclusions from observed facts.

English and American Fast Trains.

Mr. Edward Bates Dorsey, in answer to certain criticisms of *Engineering* as to alleged statements on the above subject in his paper on "English and American Railroads Compared," read before the American Society of Civil Engineers, sends to that journal the following table from his, as yet, unpublished paper:

		Miles.	Time, incl. stop. h.	m.	Speed av., incl. stops.
ENGLISH RAILROADS.					
London & N. W.	London to Liverpool	201.75	4	30	44 8
" "	" Glasgow	406	10	00	40.6
" "	" Edinburgh	401	9	55	40.4
" "	" Holyhead	261	6	40	39 6*
Great Northern	" Glasgow	444	10	20	43
"	" York	188.25	3	55	48.1
"	" Edinburgh	397	9	00	44.1
Great Western	" Swansea	216	6	00	36
"	" Bristol	118.5	2	36	45.6
Lon., Br. & S. Coast	" Brighton	50	1	05	46.15
Lon., Ch. & D.	" Dover	76.5	1	47	42.6
Midland	" Nottingh'm.	125	2	30	50
AMERICAN RAILROADS.					
N. Y., N. H. & H.	New York to Boston	234	6	00	39
Pennsylvania	Jersey City to Phila.	89	1	59	44 9
"	" Pittsburgh	443	11	45	37.7
"	" Chicago	911	25	15	36.08*
N. Y. C. & H. R.	New York to Albany	143	3	30	40.9
"	" Buffalo	441	11	00	40.1
"	" Chicago	980	25	30	38.4
Central of N. J.	Jersey City to Phila.	90	2	00	45
Balt. & Ohio	Balt. to Washington	40	0	45	53.33*

* Wrongly given in original, 39.5, 36 8 and 53.0.

Besides correcting the three fractional errors noted below the table, two of which appear to be typographical, we have incorporated above a correction made by the editor of *Engineering;* that the fastest train to Brighton makes the run in 1 hour 5 minutes, instead of 1 hour 15 minutes, but the editor himself errs, with the natural tendency of man to errors in arithmetic, in saying that this increases the average speed from 40 to 48 miles per hour, instead of to only 46.15; having evidently deducted 10 miles from the distance instead of 10 minutes from the time.

With these corrections made, the aggregates of the tables compare as follows:

12 English trains, averaging 240⅝ miles run at 43.33 m. per h.
9 American trains, averaging 374½ miles run at 41.71 m. per h.

Or, omitting the two long runs of over 900 miles from Chicago to New York:

7 American trains, averaging 214 miles run at 42.90 m. per h.

Mr. Dorsey explains that his purpose was "to show impartially the fastest average speed made by the principal railroads of the two countries, *between important cities,*" and not between intermediate and unimportant stations; instancing the "Flying Scotchman," which he gave between London and York and Glasgow, and not between London and Grantham, as had been done by *Engineering* in objecting to an abstract of his remarks. This makes all the difference between a showing of 51 miles per hour for 105½ miles and a showing of only 48.1 miles per hour for 188½ miles, or 43 miles per hour for 444 miles.

Mr. Dorsey's is certainly the fairer basis for a comparison of operating practice, and this table indicates well enough that on runs *under reasonably similar circumstances* the rates of speed *of the fastest trains* in this country and in England are much more nearly alike than is generally imagined or admitted, especially in England; but no doubt the average speed of all passenger trains is decidedly greater there than here, especially if we include all Southern and Western railroads. When we consider that there is a population of more than 2,000 per mile of railroad in England against 460 here, we can see why there should be a greater demand for speed there; and when we consider that crossings at grade are almost unknown there and are the rule here, we can see why greater speed is practicable there. A run through a long city street, and many long town streets, cannot be made at 50 miles an hour without greater slaughter than even American railroad companies can contemplate with equanimity, and slacking down to what is considered a "safe" speed in such places, at which, nevertheless, hundreds of people are killed every year, has a very bad effect on the average of a run in which the train goes much of the time 70 miles an hour. So far as locomotives and track are concerned, our railroads seem to have proved that they can make as fast time as any in the world, but few of the lines are so protected that it is safe for them to make the fastest time throughout their length. And this probably has more to do than anything else with the small number of very fast trains on the most frequented routes.

We have this week reports of July earnings from six more railroads, which, with the Reading, reported last week but not included in our summary, make 79 that have reported so far for July, whose aggregate earnings were:

	1885.	1884.	Decrease.	P. c.
Earnings	$29,603,196	$30,473,388	$870,192	2.9

For three successive years the July earnings of the Reading have been:

	1883.	1884.	1885.
Gross	$2,979,094	$2,767,792	$2,641,851
Net	1,439,422	1,216,779	1,138,647

The gross earnings this year are but 4½ per cent. less than last year, but they are 11¼ per cent. less than in 1883; and the net earnings are 6.4 per cent. less than last year and 20.9 per cent. less than in 1883. Other July earnings have been:

	1881	1882.	1883.	1884	1885.
E. T., Va. & Ga.	$222,769	$243,525	$311,784	$278,037	$298,024
N. Y. & N. Eng.	246,820	298,441	320,151	276,217	296,112
Ohio & Miss.			333,193	282,202	283,220
W. Jersey	164.888	178,147	178,532	169,505	

The East Tennessee earned 7½ per cent. more this year than last, but 4½ per cent. less than in 1883. It is working 1,120 miles of road now, against 900 in 1883 and before. The New York & New England 7.2 per cent. more than last year, and 7½ per cent. less than in 1883. Its *net* earnings in July have been:

1880.	1881.	1882.	1883.	1884.	1885.
$70,121	$97,907	$99,427	$64,078	$55,091	$109,889

Thus this year they were larger than ever before and nearly twice as great as last year.

The Erie reports a decrease of 12½ per cent. in gross and 16 per cent. in net earnings, and the Atchison, Topeka & Santa Fe a decrease of 9 per cent. in gross and 10½ per cent. in net.

The Norfolk & Western gross and net earnings have been:

	1881.	1882.	1883.	1884.	1885.
Gross	$173,375	$191,535	$219,188	$185,824	$210,267
Net	80,872	84,742	96,972	76,323	70,362

The New River Branch (75 miles) was added in 1883. The gross earnings are larger this year than in any other except 1883, but the net are the smallest since 1878—8 per cent. less than last year and 27 per cent. less than in 1883. Some other great decreases in net earnings are reported this week, as 14 per cent. by the Fort Worth & Denver, 52½ by the Memphis & Charleston, and 36 by the West Jersey. The net earnings of the Memphis & Charleston for the seven months ending with July were 67 per cent. less than last year and only $226 per mile of road. The East Tennessee's contest with the Louisville & Nashville over Memphis rates probably had something to do with this.

We should not be alarmed by very small net earnings at this time when caused by unusually large working expenses, however. Many railroads for more than a year have been putting off expenditures which ought to have been made to keep the property in good condition. Some of them, probably, have got to the point when there can be no further delay for many things; but an improved prospect for earnings is the signal for most such roads to begin to make up for lost time. They do not wait for the increase of earnings: they need the renewals before the heavy traffic begins, and are safe in undertaking them as soon as they are sure of the traffic. This is probably having considerable effect on many Southern and Southwestern railroads, which are likely to have a larger traffic than ever before, while some of them, especially in the Southwest, have not been well maintained for some time.

The Railroad Commissioners of Massachusetts have fixed the freight rates for certain articles of merchandise on the Housatonic Railroad, under the provisions of an act passed at the last session of the Legislature, to which we have heretofore referred. Accompanying the order revising the rates the Commissioners issue a report showing that under the laws of Massachusetts the Legislature has the authority, directly or by its agents, to revise rates, a proposition which the counsel of the corporation disputed and denounced. The decisions cited and the arguments submitted leave small room for counter-arguments, and it is thought that no other corporation has disputed the power of the Legislature to take such action, while on the other hand the Legislature has hitherto wisely refrained from exercising the power.

In view of the character, theory and practice of railroad supervision in Massachusetts, and the often-expressed views of the Commissioners, we imagine that they must have undertaken this work with some reluctance. They claim to have endeavored to avoid such a result by giving a full and fair hearing to shippers and the managers of the railroads, and by an earnest recommendation that the corporation should revise its tariff, reduce charges which the Commission decided to be unreasonable, and to avoid discriminations which it held to be proved. It has been the boast of the Massachusetts Commission that when after investigation it has found evils to exist, and has recommended a change in behalf of the public, its recommendations have always been heeded. But it was not supposed that the companies reduced rates or increased accommodations on account of any unusual amiability on their part; but because they had a wholesome respect for the power which might be exercised to enforce by legal process what the agents of the state appointed for that purpose had recommended. Behind the Railroad Commission recommending that something be done, they saw the General Court with a big club. The General Court is not qualified to dictate the details of railroad management, and is likely to do a great deal of harm by action taken with the best intentions; therefore, the railroad companies properly deprecate action by it, and do anything reasonable, and possibly something more, to avoid it: they do not want to see that club fall. But in this case the railroad company ignored the recommendation of the Railroad Commission, and, it is said, even neglected to fulfill promises to reduce rates. The consequence was that the aggrieved parties sought and obtained legislation which made it the duty of the Railroad Commission to fix rates in certain cases.

The danger now is that the Massachusetts public, taking its cue from this case, will seek their remedy for grievances by legislation and the new power of the Commission over rates; but this very case will probably make the railroad companies even more careful than heretofore not to provoke such legislation or the exercise of such power. They have all along imagined that the Legislature would be found standing behind the Railroad Commission; they know it now.

A question arose in Massachusetts recently as to whether an individual or association has the right to construct and operate a railroad on its own land for the carriage of passengers for hire, without organizing under the railroad or street railroad law and being subject to its various provisions intended for the safety of the public. The Onset Bay Grove Associa-

tion is the owner of a large tract on Buzzard's Bay, where it has established a camp-meeting ground, and where a number of hotels and cottages have been erected. Streets and avenues have been laid out, and on one of these, leading from the Old Colony Railroad to the camp-meeting ground, about a mile in length, the Association laid a railroad track, and undertook (by its lessee) to operate it with steam motive power.

This street, though wholly on the property of the Association, and a "private way" (inasmuch as it had not been laid out or accepted by the town), is open to the public, and at times is traveled by a large number of teams and pedestrians, as are also other streets which the railroad crosses at grade. The selectmen of Wareham, within the limits of which town the land lies, fearing that in case of accident, which seemed imminent, the town might be liable, brought the matter to the attention of the Railroad Commissioners. The Association had proceeded in good faith, without any intention of violating any law, and upon the advice of counsel; but the Commissioners found that while the law provides for private tracks for freight purposes, it is silent as to any such track for the carriage of passengers for hire, and that in this case certain provisions in relation to the use of steam power on railroads constructed upon or across streets or "traveled places" were violated. The parties interested therefore took steps toward organizing under the general street railroad law. But it is still a question whether parties have a right to construct, maintain and operate a railroad on their own land for the common carriage of passengers, provided they do not construct it upon or across a street or "traveled place," and whether they are subject to certain provisions of law intended to secure the safety of passengers.

An application of the "piece-work" system, which is rarely thought of here, possibly to the serious disadvantage of both employers and employés, is mentioned in a note from an engineer in South America. He says that, in a region where common labor for track-laying gangs commands $1.20 to $1.65 per day of 10 hours, the whole of the grading work is done by *tareas*, or task-work, at 10 cents per cubic metre, or about 7¾ cents per cubic yard; the grading being done by casting in or out from the side, and no material being hauled. The work is all measured in cut, so that the ditches must be neatly dressed; and it is found that the system is greatly preferred by the workmen, and that they make good wages at the above price in fair sandy soil, although a berme of 5 ft. is required and the ditches are sloped at 1 to 1.

The same system was extensively followed on the American lines in Mexico, and found, wherever fairly tried, to be by far the cheapest way of executing light earthwork, especially when the amount of work to be done was small, so that supervision was difficult and expensive. This latter difficulty exists with a large part of the repairing and maintenance work on railroads, and it is probable that the system might be introduced, with advantage to all concerned, for some of such work, where the chief need of supervision is to prevent "sogering." Something of the kind has been done on a large scale in Germany.

Arrangement of Car Seats for Urban and Suburban Travel.

The discussion on the disposition of car seats for suburban traffic by the Chicago Railway Club turned chiefly on the advantages and disadvantages of cars seated like those of the New York Elevated roads—that is, with seats crosswise and a centre aisle like ordinary American car seats, for about one-third of the length of the car in the centre, and side seats like street car seats at the ends next the doors. Like ordinary American cars, we said, but with the important exception that the crosswise seats are not reversible, but face each other, two pairs on each side. This arrangement secures space at the doors, and certainly shortens the stops at stations by enabling passengers to get on and off quicker. Those intending to get off gather in the space next the door as soon as their station is announced and before the train stops, and those getting on rush into this space before looking up seats. It is not so pleasant, however, to ride sideways, with your feet exposed to the tramping of passing and standing passengers, as facing the engine with one's feet safe under the next seat, and with reversible seats almost every passenger would prefer the latter arrangement. But with seats facing each other, the riding is very unpleasant if both seats are occupied, the space being so small that the knees of the opposite passenger come into contact, which is not pleasant for friends and very uncomfortable for strangers. One of the speakers in Chicago noticed that the middle cross-wise seats were usually taken first. We venture to say that this is usually the case only in the hours when the cars are generally not full, or else when the passengers have had little experience with cars of the kind. In New York the cross seats fronting the engine are usually taken first in the middle of the day, or in the evening when there is plenty of room. But the opposite seats are almost always the *last* to be taken, and one would almost think it impertinent for a person to seat himself opposite to another seat occupied by two persons so long as side seats remain unoccupied. Experienced passengers sometimes are tempted to take a cross-seat at a down-town station in the busy hours, there being as yet few people in the car, but they are apt to regret it in a few minutes, as the car fills.

Some cars seated in this way were put on the New York, Lake Erie & Western suburban trains about three years ago, but they met with such universal and outspoken condemnation by passengers that the seats were all taken out and replaced by ordinary reversible seats throughout. These cars were very light and pleasant, and the only objection was the seating; when that was changed they were generally preferred to the old cars.

With suburban traffic there is usually no good reason why the central transverse seats should not be made reversible. On the New York elevated road the apparently insuperable objection to this is that there is no time to reverse them. The car coming in at one terminus is often half filled before it has fairly discharged its passengers. Very seldom can there be such need of haste with suburban trains.

We have heretofore suggested that all the transverse seats on one side of these cars should face one way, and and all those on the other side face the other way. Thus half the passengers in these seats would ride backward, precisely as they do now, but there would be no such atrocious intermingling of legs and knees as we have now, but the same comfort as ordinary car seats afford. This might not look very pretty, but we believe that most men and all women prefer it to the present arrangement.

The corn movement to the Northwestern markets is increasing, and for the week ending August 22 was the largest since April 11, with the exception of the first week of June. Nevertheless, the receipts this year were less than last year and the year before, following small crops. The recent course of corn receipts at the Northwestern markets, is shown by the following statement of the bushels received in each of last five weeks:

July 25.	Aug. 1.	Aug. 8.	Aug. 15.	Aug. 22.
2,030,284	1,611,736	1,061,659	1,024,440	2 471,190

There is promise of so great a crop that the farmers are not likely to hold back their old corn if the price is satisfactory, and comparatively corn is now much higher than wheat. June, July and August are usually months of very heavy corn movement. For four years the movement from May 31 to August 22 has been:

	1885.	1884.	1883.	1882.
N. W. receipts	23,151,230	21,587.559	26,694,392	16,347.098
N. W. shipments	21,180,600	19,950,03)	26.077,409	15.643,928
Atlantic receipts	14,676,798	10.737,125	19,114,880	5,624.455

As the crop now moving was immensely greater than in any of the other three years, the movement is disappointing.

The Northwestern wheat receipts, which had been increasing since early in July, and reached 2,045,412 bushels in the second week of August, fell off to 1,748,958 in the third week. The Chicago receipts remained insignificant, and there was a large decrease at Toledo and a smaller one at St. Louis, indicating that these places, as usual at this time, have already had their heaviest receipts. But Detroit gained, and had the (for it) extraordinary receipts of 427,652 bushels, which is more than twice the Chicago receipts, and a sixth more than the Toledo receipts, and exceeded only at St. Louis. Last year Detroit had its heaviest receipts in October. Compared with last year, Chicago received 82 per cent. less, Toledo 54 per cent.. and St. Louis 14½ per cent. less, but Detroit more. Another indication that the winter wheat movement has culminated is furnished by the receipts at Baltimore, which are usually largest about the last week of July, and then often exceed a million bushels. This year and last the Baltimore wheat receipts have been, for five successive weeks:

	Week ending—				
	July 18.	July 25.	Aug. 1.	Aug. 8.	Aug. 15.	Aug. 22.
1884	437,921	1,003,280	1,411,448	811.441	578,6?2	542,179
1885	332,267	434.400	429,423	368,385	278,849	244,663

Already the receipts this year are 44 per cent. less than in the week to July 25. The decrease was much larger in amount last year, but it left the receipts of the third week of August more than twice as great as this year. Receipts at Philadelphia have also fallen off more than one-half in three weeks, but they have been altogether insignificant this year, the largest, in the last week of July, being 165,000 bushels this year, against 530,000, also in the last week of July, last year. On the other hand the New York receipts have increased since July, which also is usual, and they are not so much less than last year as the Baltimore and Philadelphia receipts—804,907 bushels in the third week of August, against 1,316,550 last year. For the five weeks ending Aug. 22, which usually include those weeks of largest receipts, Baltimore received 1,756,720 bushels this year, against 4,374,000 last year; while Philadelphia received 508,200 bushels, against 1,649,310 bushels last year. Meanwhile at New York, which usually has its largest wheat receipts later, they were 2,696,359 bushels in these five weeks this year, and 6,601,282 last year. The decrease is 60 per cent. at Baltimore, 70 per cent. at Philadelphia and 59 per cent. at New York.

The Northwestern wheat receipts since harvest have been sufficiently light, but the Atlantic receipts are much lighter in proportion. For the six weeks ending Aug. 22 the movement has been, in bushels, for four years:

	1885.	1884.	1883	1882.
N. W. receipts	8,435.834	14.927.468	10,552.129	16.880,110
N. W. shipments	6,115,278	11,097.194	8,649 342	15,098 162
Atlantic receipts	7,035,324	17,105,396	10.651,294	24.088,102

Thus the Atlantic receipts this year have been a sixth less than the Northwestern receipts, while last year they were a seventh and in 1882 nearly a half more. The decrease since last year has been 6,500,000 bushels (43½ per cent.) in Northwestern receipts, 5,000,000 bushels (45 per cent) in Northwestern shipments, and 10,000,000 bushels (59 per cent.) in Atlantic receipts. Compared with 1882 Northwestern receipts are 50 per cent. and Atlantic receipts 71 per cent. smaller.

The cause of the larger decrease of Atlantic receipts is the failure of the crop in most of the country which ships to them directly in Ohio, Indiana and Illinois. These states have hardly produced more than their own supply.

Chicago through shipments eastward for the week ending Aug. 29 last and for corresponding weeks of previous years have been, in tons:

1880.	1881.	1882.	1883.	1884.	1885.
40,861	63,831	37,902	39,165	29,932	31,302

Only flour, grain and provisions are included this year and last, while all freight is included for the previous years. The unreported freight is now a much larger proportion of the whole than in earlier years. It is probable that the total shipments were nearly as large this year as in any year previous except 1881.

For six successive weeks the total shipments and the percentage going by each railroad have been:

	Week ending.—					
Tons:	July 25.	Aug. 1.	Aug. 8.	Aug. 15.	Aug. 22.	Aug. 29.
Flour	2,754	2,134	2 609	1,826	2,077	2,592
Grain	9.778	7 528	15,773	10,737	20,881	20,870
Provisions	8,011	7,828	7.229	8.147	10,341	7,840
Total	20,543	17,490	26,111	20,710	37,299	31,302
Per cent.:						
C. & Grand T	14.3	15.1	12.2	10.0	12.4	17.1
Mich. Cen	8.8	8.2	31.7	23.8	18.5	13 3
Lake Shore	14.0	11.8	9.7	7.1	13.5	10.9
Nickel Plate	7.1	10.4	8.6	13 8	18.0	16.2
Ft. Wayne	23.7	23.7	16.8	15.4	14.1	13.3
C., St. L. & P	12.3	13.1	9.6	12.5	8.3	7.9
Balt. & Ohio	8.1	9.2	5.9	7.3	6 3	8.6
Ch. & Atlantic	11.7	8·5	4.3	10.1	8.9	12.7
Total	100.0	100.0	100.0	100.0	100.0	100.0

Thus last week, compared with the previous week, there was an increase of 25 per cent. in flour shipments, scarcely any change in grain shipments, and a decrease of 2,601 tons (25 per cent.) in provision shipments, which latter have been unusually large for some time.

In percentages, a large increase by the Chicago & Grand Trunk is noticeable, in spite of the decrease in provision shipments. The three Vanderbilt roads carried 40.4 per cent. of the whole, against 50 per cent. the week before; the two Pennsylvania roads 21.2 per cent., against 22.4. The Lake Shore carried an unusually large share (21.3 per cent.) of the provisions, but an unusually small one of the flour (4.7 per cent.) and the grain (7.8 per cent.).

The Nickel Plate carried much more grain than any other road (21.3 per cent. of the whole), and stood next to the Chicago & Grand Trunk in total traffic. These things indicate an unnatural condition of traffic, and that some roads were making lower rates than others. Apparently the bulk of the traffic was at 15 cents or less for grain, and 20 for provisions. The through shipments over the Nickel Plate usually go chiefly to the Lackawanna road, which has lately not brought much grain to New York.

The canal keeps its enormous lead over the railroads in carrying grain from Buffalo, in the week to Aug. 22 taking 1,816,176 bushels against 174,454 by rail,

The exports of breadstuffs in July last were extremely light—wheat nearly 50 per cent. less than last year and corn about two-fifths more. Taking all grains together, including flour, the July exports have been, in bushels:

1881.	1882.	1883.	1884.	1885.
22,521,817	13.122,409	11,312,177	13,544,614	10,531,352

Thus, the exports this year were less than in any other of the five, and not half as great as in 1881.

For the seven months ending with July the exports have been:

	Flour, bbls.	Wheat, bu.	Wheat and flour, bu.	Corn, bu.
1877	1,643,972	16.998,060	24.392,784	43,799,066
1878	2,559,439	47,332,597	58,850 072	59.497,509
1879	3,280.680	58.886.680	73.643.740	56,824,164
1880	3,415,841	74 842,853	90,214,137	76.295,830
1881	4,415,217	67,417,721	87,286,197	50,299,326
1882	3,376,334	43,347,989	58,541.492	10,525,251
1883	5,021.130	33,094.537	55.689,622	39,730 280
1884	4,895 043	35,447.176	57,474,869	21.998,154
1885	6,211,500	35,288,910	63,240,660	42,977,633

The exports of flour were thus very much larger this year than ever before, but the wheat exports were much less than in any of the four years from 1878 to 1881. Taking flour and wheat together, the exports this year were 10 per cent. more than last year and more than in 1883 and 1882, but they were 27 per cent. less than in 1881, 30 per cent. less than in 1880, and 15 per cent. less than 1879.

The corn exports were 95 per cent. more this year than last, and the largest, since 1881, but were smaller than in any year from 1878 to 1881 and 30 per cent. less than in 1880.

The *values* of the breadstuffs exports in July and for the seven months for five years have been:

	1881.	1882	1883.	1884.	1885.
July	$19,976,767	$16,468,269	$10,179,597	$12,971,754	$8,711,305
Seven mos.	131,957,684	81,324,578	95,328,532	80,546,131	85,558,982

Thus in spite of the increase of 10 per cent. in the quantity of wheat and flour exported and of 95 per cent. in the corn, the value of the breadstuffs exports was but 6¼ per cent. more this year than last. This, of course, was due to lower prices, the average having been $4 78 a barrel for flour this year, 88 cents per bushel for wheat and 52 cents for corn, against $5.53, $1.02 and 61½ cents last year. The aggregate value is 10 per cent. less than 1883 and 35 per cent. less than in 1881, but more than in 1882. In July the value was much smaller than for many years previous.

Exports of hog products, which had been increasing largely, fell off in July compared with last year, and with the excep-

tion of 1882, were smaller this year than in any other July since 1877. Notwithstanding this, the exports for the seven months ending with July were larger this year than in any other since 1881, though they compare very unfavorably with exports for four years previous, having been, in *millions* of pounds:

1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.
427 6	724.0	740.7	805.4	671.7	430.0	425 6	351.9	460.4

The increase over last year is 31 per cent., but compared with 1880 there is a decrease of 43 per cent. The *value* of the exports this year was but $2,855,000 (8⅛ per cent.) more than last year. The values for the last five years have been:

1881.	1882	1883.	1884.	1885.
$59,908,501	$44,629,116	$45,755,265	$34,205,038	$37,060,582

Compared with 1881, the decrease is $22,848,000, or 38 per cent.

In other provisions, the comparison with last year is fairly favorable as to quantities, there being an increase of more than 50 per cent. in canned beef and of 93 per cent. in salt beef, with no change in fresh beef, and a large decrease (11 per cent.) in tallow, an increase of one-fourth in butter and a small decrease in cheese. Altogether the beef and dairy products have produced for the seven months:

1881.	1882.	1883.	1884.	1885.
$22,803,340	$15,055,752	$19.642,544	$22,399,331	$19.843,787

Thus the exports of beef, cheese, etc., have been maintained much better than those of hog products since 1881. There has not been such progression in these, however, as was hoped for, and as seemed probable in 1881 and before. The exports in 1881 compared with this year were, in pounds:

	1885.	1881.	Inc. or Dec.	P. c.
Fresh beef	67,657,223	63,967,297	+ 3,689,926	5.8
Salt beef	41.724,892	22,089,261	+ 19,635,631	9.0
Tallow	32,381,020	49,761,060	— 17,380,040	34.9
Butter	10,089,307	13,413,933	— 3,324,626	24.8
Cheese	54.185,424	86,796,540	— 32,611,116	36 4
Total	206,037,866	236,028,091	— 29.990,225	12.7

Thus, in spite of a large increase in the numbers of cattle and of dairies, the exports of their produce this year have been an eighth less than in 1881.

Live cattle were not included in the report of the Bureau of Statistics until this year, and they make a very important part, the value of those exported being $9,201,448, and 6½ per cent. less than last year, which is equal to nearly half of the cattle products.

M. Emile Malézieux, who will be remembered by many American engineers as having visited this country in 1870 and made a study of our railroads and other public works, and who on his return published a work on the subject (Les Travaux publics en Amérique), died in Paris last May. His report made such an impression that in 1873 he was sent to England to study the railroads there, and his report on them is still much studied in France. M. Malézieux was educated at the Polytechnic School and the School of Bridges and Highways, graduating from the latter into the Corps of Bridges and Highways in 1846; his first service was in the construction and afterward the maintenance of a canal; in 1853 he was first engaged in railroad construction; in 1859 he came to Paris to take place in the operating department of the Belt Railroad around that city, where he remained ten years, having charge also, part of the time, of river improvements and canal construction. In June, 1868, he became a Professor in the School of Bridges and Highways, where he gave instruction until 1877 in interior navigation, and, part of the time, on general processes of construction. In 1877 he left the professorship to become Secretary of the General Council of the Corps of Bridges and Highways, which place he held at the time of his death, at the age of 63, holding the rank of "Inspector-General" in his corps—the highest grade, to which he was appointed in 1879.

Record of New Railroad Construction.

Information of the laying of track on new railroads in the current year is given in the present number of the *Railroad Gazette* as follows:

Augusta, Gibson & Sandersville.—Extended southwest to Glover's, Ga., 11 miles.

Houston, East & West Texas.—Extended from Keachi, La., southwest 7 miles.

Jacksonville, Tampa & Key West.—Extended from Palatka, Fla., southward 5 miles.

Kansas City & Southern.—Extended from Blairstown, Mo., north by west to East Lyon, 16 miles.

Pennsylvania.—The *Ridgeway & Clearfield Branch* is extended from Brockwayville, Pa., to Falls Creek, 10 miles.

This is a total of 49 miles on 5 roads, making 1,564 miles thus far reported for the current year. The new track reported to the corresponding date for 14 years past has been:

	Miles		Miles.
1885	1,564	1878	1,160
1884	2,344	1877	1,170
1883	3,550	1876	1,467
1882	6,668	1875	702
1881	4.018	1874	1,006
1880	3,196	1873	2,284
1879	1,798	1872	4,498

This statement covers *main track only*, second or other additional tracks and sidings not being included.

TRADE CATALOGUES.

The Bentley-Knight Electric Railway Company: No 115 Broadway, New York.

This company has printed a pamphlet describing the plant which has been used in working the East Cleveland street railroad for a year past. The company announces that it is now ready to contract for lines on a large scale, whether surface, elevated or underground roads, and gives in this pamphlet not only a description of its system, but estimates of cost. Besides the dynamo station, the chief parts of the plant consist of a conduit along the whole line containing permanent conductors, which convey the current from the dynamos to the electric motors placed under the cars and geared to the axles; a depending conductor from the motor passing through a slot in the conduit and sliding in contact with the permanent conductor; and the motor attached to each car.

An estimate is given of the cost of an electric railroad of five miles of double track, with 40 cars running at intervals of 2½ minutes at 6 miles per hour, making the total $344,100, as against $162,000 for a horse railroad with equivalent equipment (360 horses). The cost of the conduit is given as $11,600 per mile; of the dynamo station and plant, $82,500; and of the motors, $1,200, or $30 each. The expense of motive power is given as $30,551.50 per year, including interest on plant, against $102,960 for a horse railroad, 3 per cent. being allowed as the cost of maintaining the electrical plant. To change a cable railroad of this size to an electric road will cost, it is said, $113,600, and it will then cost $55,954 to work, against $75,590 for the cable road.

TECHNICAL.

Brake Tests.

The special train of the American Brake Co., of St. Louis, has reached Cincinnati on its return trip, and on Aug. 27 a number of tests of the brake were made of the Ohio & Mississippi road in the presence of a large number of railroad officers of Cincinnati lines. Nine stops were made in all, at speeds varying from 20 to 36 miles an hour. The train consisted of engine, tender with steam driver and tender brake, 12 coal cars and 2 box cars, provided with the automatic freight car brake, and 4 box cars without automatic brakes, the length of the train being 670 ft. and its weight 350 tons. At speed of 30 miles an hour a stop was made in 26½ seconds and a distance of 560 ft. At 20 miles an hour a stop was made in 14½ seconds and a distance of 194 ft., and the other stops were equally satisfactory.

A Handsome Private Car.

The Barney & Smith Manufacturing Co. has recently built a very elaborate car for Dr. W. Seward Webb, the son-in-law of W. H. Vanderbilt and the President of the New York Central Sleeping Car Company, designed throughout by the manufacturers. It is a complete suite of elegant apartments, 60 × 10 ft. in extreme dimensions of body. The apartments in order are:

The kitchen, at one end, furnished throughout in black walnut, with a narrow hallway in black walnut at one side, which passes the butler's pantry and saloon and toilet room to the first sleeping section, of two lower and two upper berths. The upholstering is dark blue plush, and the roll curtains are of English tapestry, of a peacock blue and olive shade.

Heavy old gold and dark blue silk plush portieres, hung to lace-work of brass chains and jewels trimmed with gold cord, close the entrance to the main apartment, which is the full width of the car and about 17 ft. long. The carpet is an Axminster, matching the drapery. The room is furnished with a stationary mahogany centre table, with extension attachment, a secretary's desk and a lounge, which also serves the purpose of two berths by raising the back and pulling out the lounge itself. The woodwork throughout is mahogany; the windows, three on each side, are 4 ft. by 3 ft. 6 in., fitted with the Ormsby sash-balance. A state room follows, 8 ft. by 12 ft., also finished in mahogany, and connected with a private toilet room. The steam heater follows, and beyond it the smoking room, which is connected with the parlor by a side hallway, finished in paneled mahogany. The smoking room is finished in smoked oak; the upholstering is morocco leather, and the lounge opens into two berths, which can be inclosed or separated from the other part of the room by curtains of the same material as the portieres in the parlor. Large plate-glass windows, 4½ by 5 ft., afford a view of the receding scenery.

Power Required on Elevated Railroads.

A test of a locomotive in operation on the Third Avenue Elevated Railroad, New York, was recently made by Mr. Angus Sinclair, and described in the *Car-Builder;* the engine drawing the usual load of a train of four cars weighing some 66 tons, over its route of 8½ miles, making twenty-five stops. The engine weighs 24 tons; cylinders, 11 in. by 16 in.; average indicated horse-power, 163.4; running time, 20 minutes; stopping at stations, 22 minutes. The effect of the great number of stops is shown in the fact that the average train resistance reached 42 lbs. per train-ton, which is about five times the estimate of the pull on the draw-bar if the motion of the train could be continuous. The average horse-power exerted by the locomotive, including time and stations, is 77.8; and as there are 63 trains on the road at the same time, there is an aggregate expenditure of 4,901 horse-power on the road. The evaporation of the boiler on the basis of all coal used, without making any allowances, was 7.4 lbs. water per pound of coal; and the hourly consumption of coal was 5.8 lbs. per horse-power.

Premium for a Car Coupler.

Notice has been received that the Jury Commission of the International Inventions Exhibition in London, acting on the recommendations of the jury, has awarded a silver medal, in group 5, for the Janney coupler and buffer, which were there exhibited.

Improvement in Draw-Gear.

Mr. George J. Johnson, of La Crosse, Wis., an old conductor on the Chicago & Northwestern road, has invented a draw-gear attachment for railroad cars that is very well spoken of wherever it has been used. It provides for connecting the draw-bar by cross-pieces to the sills, for the purpose of preventing the draw-bar from being pulled out. Spiral springs are used to absorb violent shocks, and a combination is formed that is likely to prevent the troublesome and dangerous delays caused by the pulling out of draw-bars. The invention can be applied to any form of car.—*National Car-Builder.*

Old Locomotives.

The Illinois Central Railroad Co. has got 12 Rogers locomotives in service that have been running over 30 years, and they still have the original boilers in use. Most of these engines are light, weighing about 25 tons, and have cylinders 15 by 22 in. and wheels 5 ft. diameter. The engines are now getting too light for the work of the road and they will probably be cut up within a very few years, and the company can well afford to put the engines aside, for few locomotives have earned an equal amount of money. The oldest engine still running on the road is a Rogers make, which has been in service 33 years. Nearly 30 years ago this engine was run for some time by Mr. Morris Sellers, the well-known railroad supply dealer, and at that early day the engine was regarded as a wonder among locomotives, owing to the astonishing weight of trains she could pull.—*National Car-Builder.*

THE SCRAP HEAP.

Bridge Burners in Illinois.

A dispatch from Bloomington, Ill., Aug. 31, says: "News has been received here of an unsuccessful attempt made by a gang of masked men, early Sunday morning, to burn a bridge on the Indiana, Bloomington & Western Railroad, near Danvers. It is thought their intention was to wreck the through express train, which passes here after midnight. A farmer discovered the bridge on fire and started to quench the flames, but was commanded to 'move on and let that alone.' He drove hastily to Danvers, three miles distance, and gave the alarm in season to stop the express. The train approached cautiously and stopped, and a half dozen men fled to the brush. The bridge was 84 ft. long and 15 ft. high. It had been saturated with kerosene and was badly burned."

An Old Employe.

"I am the oldest man in the employ of the two biggest corporations in this country," said Isaac Fisher, 80 years old, to a reporter to-day. "One is the United States Government itself and the other is the Pennsylvania Railroad Co."

The old man, although he has handled mail bags for upward of 50 years, can be seen every day from 7 a. m. until 10 p. m. pushing his big truck between the passenger station and the Post Office at this place "Old Isaac," as he is familiarly called, was born in Bedford County, in August, 1805, and, after roughing it at the old ancestral homestead until he was 19 years old, he ran away from home and went to Hollidaysburg, then the liveliest town between Harrisburg and Pittsburgh, being an intermediate point where the pack trains were made up to cross the Alleghany Mountains. Here his hardy frame at once secured him employment in a warehouse, and in 1834 he made his début as a stage driver and mail carrier on the old turnpike from Lewistown to Blairsville, through Mifflin, Huntingdon, Blair, Cambria and Indiana counties. In this capacity he continued, driving his four-in-hand across the Alleghanies, until the Pennsylvania Railroad was built, in 1850, when he was made manager of the water station at this place, and carrier of the mail bags from the trains to the Post Office.

Ever since 1850 the old man has pushed his big truck full of mail bags from the station to the Post Office. In rain or shine, in winter or summer, old Isaac is to be found faithfully at work. Now he is bent with years and toil, but still pursues his calling with careful fidelity. His friends here are getting up a petition addressed to President Roberts, of the Pennsylvania Railroad Co., requesting that a pension be awarded Mr. Fisher in consideration of his life-long service and his old age. When Mr. Fisher obtains his pension, and only then, he will settle down and enjoy the reward of his labors.—*Huntingdon (Pa.) Correspondence New York Times.*

Fast Freight Time.

The fastest time ever made by a freight train on the Chicago, Burlington & Quincy was recently, when a stock train ran over the middle division, from Creston to Ottumwa, 115 miles, in 3 hours and 20 minutes, or 34½ miles an hour, without allowing for stops. It actually passed an express on a siding. The actual running time was 40 to 45 miles an hour. Nothing is said as to the equipment of the cars, but unless power brakes were used the speed was dangerous.

An Unlucky Name.

Curious names are given to trains sometimes by railroad men. "Owl" trains, "Cannon-ball" and "Flying Yankee" are easily understood, but not so with some others. One train on the Erie is known as the "Hojack," and another as the "Horn" train, and many years ago there was a train on the Camden & Amboy which was commonly called the "Bed Bug." The worst name yet, however, is that given to the Cape Cod express on the Old Colony road, which is known as the "Flying Dude." With such a title it could not help coming to grief, and accordingly the "Flying Dude" went off the track at Middleboro one day this week, and the engine tumbled into a turn-table pit.

Train Robbers.

A dispatch from Kansas City, Mo., Sept. 2, says: "A bold robbery occurred on the Chicago & Alton Railroad to-night, but owing to the sudden fright of the robbers but little booty was secured. As the west-bound train on the way to this city left Blue Springs 22 miles east from here, about 9 o'clock to-night, four masked men appeared at the smoking car and were about to board it. A number of men, however, were standing on the platform, and the robbers passed to the next car in line—the day coach. Three of them climbed upon the forward platform, and the fourth got on at the rear. A man then mounted guard at each end of the car, while the other two entered, and with drawn revolvers commanded the passengers to give up their money. A number of them handed out small amounts of change, while one man in his excitement passed out his purse containing about $23. The robbers took whatever was offered without searching passengers, and made no attempt to rob them of jewelry. When the pair had reached the middle of the car they became suddenly alarmed, and pulling the bell rope the four robbers sprang off when the train slackened speed, and disappeared in the darkness. The train passed on, and the conductor, James Bogge, reported the affair to the officials of the road from the next telegraph station. The train then proceeded on its way to this city. The passengers on the other cars knew nothing of the matter until it was all over. There was then great excitement among the more timid, and many hastened to secrete their valuables and prepare for a return of the robbers, though all danger had passed. The passengers of the car that was robbed had scarcely time to realize what had occurred before the robbers disappeared."

A "Missionary Car."

Members of the Portland, Oregon, Board of Trade have originated a novel scheme for attracting immigration to their state. It consists of what they call a "missionary car," fitted with the choicest specimens of the fruits, grasses, grains and woods of Oregon. This exhibit will be taken on a tour through some of the Eastern states, the railroad companies furnishing free transportation.

Sunday Work on Railroads.

The Boston *Advertiser*, in an article on Sunday trains, says: "It may be concluded that it is not a desire for the production of wealth that has led to the practical annulment of our Sunday laws to such an extent, but the demands of the community for personal services seven days in the week. This is not asked of merchants and storekeepers, nor do manufacturers undertake it on their own account, except under pressing necessity.

"Sunday labor is, therefore, an element outside our economic system so far as production is concerned, and is to be viewed chiefly in its effect upon those engaged in it. The general concurrence of evidence thus far obtained is that there is usually an indisposition among employés to do work

on Sunday, notwithstanding seven days' pay is thereby secured. Further than this, it appears that, with some solitary and remarkable exceptions in the horse railroad service, it is unusual for continuous Sunday service to be rendered, there being a shifting and exchange of work which secures a day off for all who wish it. Also, no evil results seem to follow such employment. If, then, in the development of our modern civilization, the convenience or the pleasure of the public shall come to require a yet more general service of labor on this day, the system will doubtless adapt itself, as it has already, to the beginning of the change. Meantime, as is intimated in the report to which reference has been made, the only influence which can effect a cessation of Sunday labor is a return on the part of the community to that condition in which it existed half a century ago, when the present artificial needs did not exist, and no one cared for many of the services which now every one demands."

Sunday Trains in Massachusetts

Notwithstanding the spirit and the letter of our laws, which have ever been strictly prohibitory of all labor on the "Lord's day," except that of "necessity or charity," the amount of work done on Sunday has of late years greatly increased. This work can, in very few instances, be deemed necessary except as the artificial demands of our social condition may be thought to create a necessity, but it employs a vast amount of capital, many thousands of hands, and is therefore to be considered an element in our industrial development, apart from its moral relations. Such a consideration is given this subject in the late report of the Bureau of Statistics of Labor, to which reference has already been made, the purpose of the inquiry being to ascertain facts concerning Sunday labor from which may be judged its economic relations and effects.

It appears with sufficient distinctness that, in the industry employing the greatest amount of Sunday labor, that of transportation by steam and horse railroads, the innovation was made and the laws set aside by the compulsion of popular demands, and not through any disposition of the managers to extend their business and add to its gains. The first Sunday trains in Massachusetts were run to complete the trips of the New York boats. Then came the milk trade with its call for Sunday service in answer to the requirement on the part of the consumers for a fresh delivery Sunday mornings. The business community desired a Sunday mail to New York, and out of this developed the through passenger traffic on that day. Yet more significant in this connection is the origin of the local Sunday train service, connecting Boston with the outlying towns and cities so extensively used for residential purposes. Twenty-five years ago a local train was put on between Boston and Brookline, at the request of members of Boston churches residing in that town, for their convenience in attending religious services. On the discontinuance of the horse railroad to Quincy, a similar appeal from the churchgoers was answered by the establishment of a like service on the Old Colony road. The Boston & Providence road had the same experience. The Sunday train service being thus brought into existence for the convenience of the churches, its extension became necessary when the development of our seaside resorts presented attractions for those in search of Sunday recreation. The horse railroads passed through exactly the same experience; and now, in the face of the prohibitory statute, there are 259 Sunday trains running in the state, and on the horse railroads 786 cars, employing 2,958 men.—*Boston Advertiser.*

A Railroad Relic.

Mr. P. J. Cochrane, Master of Machinery of the South Carolina Railway, has in his possession a piece of the first strap rail put down on the road he is connected with. That road has a claim to high distinction among American railroads, for the company were the first in the world to decide that their line should be operated by locomotives. When the directors of the Liverpool & Manchester Railway, the first line in England built for general traffic, were disputing among themselves about what form of traction they should use, the majority favoring rope traction and stationary engines, the directory of the South Carolina Railway, then under construction, decided to operate by locomotive engines, and gave their president permission to have an engine built. Many relics of this pioneer road were preserved for years, but most of them were destroyed or lost during the chaos and disorder caused by the war.—*National Car-Builder.*

The Oldest Locomotive.

"Burdette," in the *Pathfinder Guide* for September, says: "The oldest locomotive in the United States is now running on the Lynchburg & Ochiltree Short Line, hauling a local passenger. We do not make this statement as an actual truth, but merely to develop the fact, in the columns of our exchanges, that the oldest locomotive in the United States really and truly is running on all the railways between Halifax and 'Frisco. You see if it isn't."

Accident in Erecting an Iron Roof.

An accident, resulting in two deaths and seven injuries recently occurred at Huddersfield, where the London & Northwestern Railway is enlarging its Huddersfield station and erecting a new iron roof. The roof outside the station had to be supported on iron pillars fixed at regular intervals. About eight or nine of these pillars had been fixed, and the roof rested apparently securely on about five of them. A powerful movable platform had been used for the purpose of erecting the new roof, and this had been moved from under it with the view of continuing the erection further along the station. Immediately after two trains had passed under the structure the whole of the new roof collapsed, and brought with it a number of joiners, who had been working among the girders. The lines were blocked four hours.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:

Chicago & Eastern Illinois, annual meeting, at the office in Chicago, Oct. 6, at noon. Transfer books close Sept. 25.

Louisville & Nashville, annual meeting, at the office in Louisville, Ky., Oct. 8.

Minneapolis & St. Louis,—Annual meeting, in Minneapolis, Minn., Oct. 6. Transfer books close Sept. 5.

Northern Pacific, annual meeting, at the office in New York, Sept. 17.

Ohio & Mississippi, annual meeting, at the office in Cincinnati, Oct. 8. Transfer books close Sept. 12.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows:

Boston & Albany, 2 per cent., quarterly, payable Sept. 30, to stockholders of record on Aug. 31.

Chicago & Northwestern, 1¾ per cent., quarterly, on the preferred stock, payable Sept. 25, to stockholders of record on Sept. 8. The company drops from 2 to 1¾ per cent.

Oregon Railway & Navigation Co., 1½ per cent., quarterly, payable Oct. 1,

West Jersey, 3 per cent., semi-annual, payable Sept. 15, to stockholders of record on Aug. 28.

West Jersey & Atlantic (leased to West Jersey), 2 per cent., semi-annual, payable Sept. 15.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be as follows:

The *National Association of General Passenger & Ticket Agents* will hold its next half-yearly meeting in New York, at 11 a. m., on Tuesday, Sept. 15.

The *American Institute of Mining Engineers* will hold its fall meeting in Halifax, Nova Scotia, beginning on Wednesday, Sept. 16.

The *Brotherhood of Locomotive Firemen* will hold its annual convention in Philadelphia, on Monday, Sept. 21.

The *Western Railway Club* will hold its next regular meeting in Chicago, on Wednesday, Sept. 23.

The *General Time Convention* will meet at the Grand Pacific Hotel, in Chicago, on Thursday, Oct. 8.

The *Southern Time Convention* will meet at the National Railway Exchange, No. 46 Bond street, New York, on Wednesday, Oct. 14.

The *Roadmasters' Association* of America will hold its annual convention in Chicago, beginning on Wednesday, Oct. 14.

The *Association of American Railroad Superintendents* will hold its semi-annual meeting at No. 46 Bond street, New York, at 10 a. m., on Thursday, Oct. 15.

The Roadmasters' Association.

The Roadmasters' Association of America will hold its annual convention in Chicago on Wednesday, Oct. 14 next. The meeting is expected to continue for three days, and all roadmasters are cordially invited to attend. The arrangements for the meeting will be announced hereafter.

ELECTIONS AND APPOINTMENTS.

Albany & Susquehanna.—At the annual meeting in Albany, Sept. 1, the following directors were chosen: Daniel Manning, H. G. Young, Albany, N. Y.; John Weston, Richmondville, N. Y.; Minard Harder, Cobleskill, N. Y.; George I. Wilber, Oneonta, N. Y.; James Roosevelt, Hyde Park, N. Y.; Coe F. Young, Honesdale, Pa.; M. Olmstead, Morristown, N. J.; David Dows, N. M. Olyphant, James R. Taylor, Alfred Van Santvoord, New York. The board elected Coe F. Young, President; Wm. F. Phelps, Vice-President.

Bellaire, Zanesville & Cincinnati.—Mr. W. T. Morris has been appointed Superintendent in place of W. R. Crumpton, resigned. The office of General Manager is abolished. Mr. J. M. Miller is appointed General Freight and Ticket Agent. Offices at Woodsfield, Ohio.

Chautauqua Lake.—This company was organized at a meeting held in Jamestown, N. Y., Aug. 25, when the following directors were chosen: Edward O. Emerson, Roger Sherman, Titusville, Pa.; Moses Beecher, Warren, Pa.; Alfred Short, Northeast, Pa.; Daniel C. Oyster, Ridgway, Pa.; Almet N. Broadhead, Frank E. Gifford, Orsino E. Jones, Robert N. Marvin, Jamestown, N. Y.; G. Henry Whitcomb, Worcester, Mass.; Henry D. Hyde, Wm. A. Paine, A. A. Pope, Boston. The board elected officers as follows: President, A. A. Pope; Vice-President, Robert N. Marvin; Secretary and Treasurer, Eugene F. Fay, Boston.

Chicago, Milwaukee & St. Paul.—Mr. F. D. Underwood is appointed Superintendent of the Iowa & Dakota Division in place of Mr. G. W. Sanborn, resigned. Mr. H. R. Williams succeeds Mr. Underwood as Superintendent of the Southern Minnesota Division, and Mr. E. H. Graves, late Assistant to Mr. Sanborn, takes Mr. Williams' place as Superintendent of the Iowa & Minnesota Division.

Chicago & Northwestern.—Mr. W. B. Kniskern is appointed Assistant General Passenger Agent, and Mr. Herman Wheeler Assistant General Ticket Agent, to date from Sept. 1. Offices in Chicago. Mr. Wheeler has been in the general ticket office of the road for several years. Mr. Kniskern was formerly Agent for the Chicago, St. Louis & Pittsburgh in Chicago, but for some time past has been Agent for the Louisville & Nashville in New Orleans.

Cincinnati & Eastern.—Mr. B. F. Coates has been appointed Receiver of this road in place of John R. McLean, resigned.

Cleveland, Columbus, Cincinnati & Indianapolis.—The following circular is dated Cleveland, O., Aug. 29: "Mr. Edgar Hill is appointed General Freight Agent of this company, vice Mr. Lucien Hills, who is appointed General Agent. Mr. Albert S. White, General Agent at Indianapolis, is appointed Assistant General Freight Agent, with office at Cleveland. Mr. J. Q. Van Winkle, Agent at Indianapolis station, is hereby appointed Division Freight Agent, with office at Indianapolis, vice Mr. Albert S. White. The title of Mr. M. S. Wasson, Assistant General Freight Agent of Indianapolis & St. Louis Railway, is changed to that of Division Freight Agent. Above changes to take effect Sept. 1."

Georgia.—Mr. J. W. Fielder is appointed Car Accountant, with office in Augusta, Ga., in place of F. W. Kiely, transferred to other duties.

LaFayette, Newtown & Wabash River.—The officers of this new company are: President, George J. Henninger; directors, Adam Blin, N. W. Fisher, Andrew E. McCorkle, Samuel Meharry.

Louisville, New Albany & Corydon.—At the annual meeting in Corydon, Ind., recently, the following directors were chosen: B. P. Douglas, Thomas McGrain, S. M. Stockslager, Corydon, Ind.; St. John Boyle, John E. Green, H. H. Littell, Bennett H. Young, Louisville.

Marquette, Houghton & Ontonagon.—The following circular from General Manager J. Hornby, is dated Marquette, Aug. 25: "Mr. George S. Hobbs is appointed Auditor of the company. From this date all accounts will be kept, and reports made, according to his directions."

Mr. Hobbs was formerly Cashier and Paymaster of the Eastern Railroad, now leased to the Boston & Maine.

Mexican Central.—Mr. Edward W. Jackson, the new General Manager, took charge of this road on Sept. 1.

New York, Lake Erie & Western.—Mr. Robert Gunn has been appointed Master Car-Builder in charge of the Buffalo shops, in place of Milton Wilder, resigned. Mr. Gunn was formerly at the Hornellsville shops, and for some time past has been General Foreman at Buffalo.

St. Joseph & Grand Island.—Mr. Frank Milligan is appointed General Freight and Passenger Agent, with office in St. Joseph, Mo. He was recently on the Detroit, Mackinac & Marquette road.

Wisconsin Central.—Mr. A. A. Allen is appointed Assistant to the General Manager, a new office. Mr. F. A. Merrill is appointed Superintendent of the Milwaukee, Eastern and Southern divisions, to succeed Mr. Allen, with Mr. N. J. Finney as Assistant Superintendent. Mr. Merrill will also retain charge of the sleeping and parlor car service over the road. Mr. P. Walling (late Superintendent of Bridges and Buildings) is appointed Superintendent of the Middle and Northern divisions.

PERSONAL.

—Mr. John R. McLean has resigned his position as Receiver of the Cincinnati & Eastern road.

—It is reported that Mr. John F. O'Brien has resigned his position as Assistant General Manager of the East Tennessee, Virginia & Georgia road.

—Mr. Walter de Kantzow, for some time past Resident Engineer of the Cincinnati, New Orleans & Texas Pacific line, died in Cincinnati, Aug. 20.

—Mr. Octave Chanute, the well-known engineer, has been elected a Vice-President of the American Association for the Advancement of Science for the ensuing year.

—Mr. G. W. Sanborn has resigned his position as Superintendent of the Iowa & Dakota Division of the Chicago, Milwaukee & St. Paul road, on account of ill heath. He has been on the road over 20 years.

—Mr. E. S. Bowen, Vice-President of the New York, Lake Erie & Western Co., is reported to be seriously ill, and it is also reported that he has tendered his resignation of his position on account of his failing health.

—Mr. John Scott, recently President and General Manager of the Cincinnati, St. Louis & Texas Pacific Co., has been presented by the officers and employés of the road with $3,000 in government bonds, as testimonial of their esteem. At the same time Mrs. Scott was presented with a valuable set of silver.

—William B. Ripley, ticket agent of the Louisville, New Albany & Chicago road, at LaFayette, Ind., disappeared Aug. 28, and with him also disappeared the proceeds of a large number of tickets, sold the day before for an excursion over the road. He is supposed to have taken over $1,000, but the exact amount is not known.

—Mr. William Caldwell, who died last week at his home in Durhamville, N. Y., is said to have been the first railroad superintendent in the United States. He had charge of the construction of the old Mohawk & Hudson road in 1831, and was subsequently superintendent of the road for a short time. He had not been in railroad business for a number of years past.

—Mr. Milton Wilder, for 33 years past Master Car-Builder in charge of the New York, Lake Erie & Western shop in Buffalo, has resigned his position on account of ill health and increasing age. He expects to go to California, where he has three sons residing. Mr. Wilder was born in Attica, N. Y., and in 1842, and was employed in the construction of the old Attica & Buffalo road, now owned by the Erie. In 1852 he was placed in charge of the Buffalo car shops and has retained that position ever since. Mr. Wilder was very popular among the employés of the shops, and on the announcement of his resignation they presented him with a valuable gold watch and chain as a testimonial of their esteem.

—Mr. W. W. Shippen died at his summer residence in Seabright, N. J., Sept. 2, aged 58 years. He was born in Bordentown, N. J., and in early life served in the Navy as a midshipman and afterward as a civil engineer on the Camden & Amboy road. Some 37 years ago he entered the employ of the late Edwin A. Stevens, and some years later was made President of the Hoboken Land & Improvement Co., of which Mr. Stevens was the chief owner. He also represented Mr. Stevens in other business affairs and was executor of his very large estate. Mr. Shippen accumulated a considerable fortune for himself, and of late years took quite a prominent part in New Jersey politics as a Democrat. He was for several years a director of the New York, Lake Erie & Western Co., and was a director of the Morris & Essex Co. for many years and up to the time of his death.

—Mr. Samuel Bradford, for many years Treasurer of the Philadelphia & Reading Co., died very suddenly Aug. 31, in Boston, where he had stopped for a few days while on his way home from Rye Beach, N. H., to Philadelphia. Mr. Bradford was born in Boston March 26, 1803. His father was Samuel Bradford, who was United States Marshal of Massachusetts under the administrations of Presidents Washington and Adams. His mother was Ann Williams, a duughter of the youngest sister of Benjamin Franklin and a sister of General Jonathan Williams, of the Revolutionary army. He was educated in Boston. Mr. Bradford came to Philadelphia in March, 1835, to visit relatives. While there he was offered and accepted a position in the office of the Little Schuylkill Navigation, Railroad & Coal Co., which was then in course of organization. In January, 1833, he was elected Secretary and Treasurer of the company. In January, 1838, Mr. Bradford was elected Treasurer and Secretary of the Philadelphin & Reading Railroad Co. He resigned his position in the Little Schuykill Co. in 1844, and in 1856 he resigned the secretaryship, retaining his position as Treasurer of the Reading until January, 1884, when, owing to advancing age, he declined re-election. At the time of the contest between the McCalmonts and Mr. Gowen and his friends for the control of the road, Mr. Bradford was the only officer who received the unanimous vote of both parties at the annual election. At the time of his death he was a manager for the Pennsylvania Institution for the Deaf and Dumb. He was also a trustee of the First Unitarian Church. Mr. Bradford in 1835 married a daughter of John Wood, of Newburyport. Mrs. Bradford and two daughters survive him.

TRAFFIC AND EARNINGS.

Coal.

Coal tonnages for the week ending Aug. 22 are reported as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Anthracite	723,786	776,293	D. 52,507	6.9
Eastern bituminous	154,821	193,540	D. 38,719	20.0
Coke	47,442	62,822	D. 15,380	24.4

The Reading Co. announces an increase of from 10 to 20 cents per ton in September prices of coal. On the other hand the Lehigh Valley Co. has made a reduction of 20 cents per ton in tolls on coals carried to tidewater, the avowed object being to enable operators to meet the low prices ruling. The Lackawanna announces its intention to mine all the coal it can sell up to its full quota, and opposes any stoppage of production.

The anthracite coal tonnage of the Belvidere Division, Pennsylvania Railroad, for the eight months to Aug. 29 was:

	1885.	1884	Inc. or Dec.	P.c.
Coal Port for shipment	53,472	65,379	D. 8,907	13.7
S. Amboy " "	366,261	405,154	D. 38,893	9.6
Local points on N. J. divs.	501,633	508,117	D. 6,484	1.3
Co.'s use " "	143,508	121,416	I. 22,092	18.2
Total	1,067,874	1,100,066	D. 32,192	2.9

Of the total this year 876,364 tons were from the Lehigh Region, and 191,510 tons from the Wyoming Region.

Actual tonnage passing over the Huntingdon & Broad Top road for the eight months to Aug. 29 was:

	1885.	1884.	Inc. or Dec.	P. c.
Broad Top coal ...	101,703	125,802	D. 24,096	19.1
Cumberland coal ..	302,055	283,290	I. 18,765	6.6
Total.....	403,758	409,092	D. 5,334	1.3

The Broad Top coal is mined on the line; the Cumberland coal is carried through from Mt. Dallas to Huntingdon for the Pennsylvania Railroad.

Cumberland coal shipments for the eight months to Aug. 29 are given by the Cumberland *Civilian* as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Baltimore & Ohio R. R	1,288,781	1,378,254	D. 89,473	6.5
Bedford Div., Pa. R. R	270,996	258,183	I. 12 813	5.0
Chesapeake & Ohio Canal.	211,789	202,078	I. 9,711	4.8
Total.....	1,771,566	1,838,515	D. 66,949	3.6

Local deliveries are included in Baltimore & Ohio tonnage. Shipments from mines to distributing points were: Cumberland & Pennsylvania Railroad, 1,146,834; George's Creek & Cumberland, 361,996; West Virginia Central & Pittsburgh, 266,065; total, 1,774,895 tons.

Railroad Earnings.

Earnings of railroad lines for various periods are reported as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Eight months to Aug. 31:				
Mil., L. S. & W.	$880,851	$794,650	I. $86,201	10.8
Seven months to July 31:				
Atch., T. & S. F..	$8,409,039	$8,948,452	D. $539,413	6.0
Net earnings...	3,650,001	4,019,713	D. 369,712	9.2
Det., Lan. & No.	647,438	776,937	D. 129,499	16.7
E. Ten., Va. & G.	2,049,951	2,142,315	D. 92,364	4.3
Net earnings...	636,888	718,023	D. 81,135	11.3
Ft. Worth & D..	260,463	284,465	D. 24,002	8.4
Louisv. & Nash..	7,891,188	7,616,349	I. 274,839	3.6
Net earnings...	3,004.058	2,689.713	I. 314,345	11.7
Mem. & Charles.	695.140	760,572	D. 65,432	8.6
Net earnings...	65,883	200,866	D. 134,985	67 3
N. Y., Lake Erie & Western. ..	10.218,888	11,256,150	D. 1,037,262	9.3
Netearnings...	2.039.990	1,977,717	I. 62,273	3.2
N.Y.& N.England	1,810.057	1,864,076	D. 54,019	2.9
Net earnings...	548,343	349.025	I. 199,318	57.1
Norfolk & West..	1,447.297	1,432,327	I. 14.970	1.0
Net earnings...	516,054	535,072	D. 19,018	3.4
Ohio & Miss.....	2,021,636	2,078,109	D. 56,473	2.7
West Jersey	680,299	706,042	D. 25,743	3.6
Net earnings..	236,253	265,329	D. 29.076	10.9
Six months to June 30:				
Central Branch..	$892,562	$776,300	I. $116,262	15.0
Net earnings...	363,391	265,208	I. 98.183	37.0
N. Y., Chicago & St. L.....	1,480,899	1.516,681	D. 35,782	2.4
Net earnings...	371,559	396.803	D. 25,244	6 4
N. Y., Ont. & W..	845,755	827,705	I. 18,050	2 2
Net earnings...	58,325	50,883	I. 7.442	14 6
Month of July:				
Atch., T. & S. F.	$1,181,783	$1,301,637	D. $119,854	9.2
Net earnings...	535,072	483.773	I. 51.299	10.6
Det., Lan. & No.	93,592	97,903	D. 4,311	4 4
E. Ten., Va. & G.	298,824	278,037	I. 20,787	7.5
Net earnings...	131,328	90,161	I. 41,167	45.7
Ft. Worth & Den.	49,067	50,359	D. 1,282	2.5
Net earnings...	22.757	26,439	D. 3,682	14.0
Louisv. & Nash..	1,057,332	1,060,104	D. 2,772	0.3
Net earnings...	361,445	435.233	D. 73.788	17 0
Mem & Charles.	83,816	105,471	D. 21,655	20.5
Net earnings...	15,076	31,741	D. 16,665	52.6
N. Y. Lake Erie & Western....	1,561.721	1,784,639	D. 222,918	12.5
Net earnings...	370,555	441.303	D. 70,748	16 0
N.Y.&N.England	296,112	276,217	I. 19.895	7.2
Net earnings...	104,889	55,091	I. 54,798	99.6
Norfolk & West..	210,267	185.824	I. 24,443	13.0
Net earnings...	70,362	76,323	D. 5,961	8.0
Ohio & Miss.....	283,220	282,202	I. 1,018	0.4
West Jersey	169,505	178,532	D. 9,027	5.0
Net earnings...	51.371	80,114	D. 28,743	35.9
Month of August:				
Mil., L. S. & W..	$131,305	$95,094	I. $36,211	38,1
Third week in August:				
Chi. & East. Ill..	$38,035	$42,204	D. $4,169	9.9
Chi., St. P., M. & Omaha.....	114,500	102,800	I. 11,700	11.6
Illinois Central..	210,700	222,474	D. 11,774	5.3
Iowa lines.....	31,300	31,242	I. 58	0.2
Long Island.....	87,787	102,804	D. 15,017	14.6
Louis. & Nash...	241.265	260,580	D. 19,315	7.5
Oreg. R. & N. Co.	87,000	67,000	I. 20,000	29.1
St. P. & Duluth..	28,916	29,135	D. 219	0.8

Weekly earnings are usually estimated in part, and are subject to correction by later statements. The same remark applies to early statements of monthly earnings.

Cotton.

Cotton movement for the week ending Aug. 28 is reported as below, in bales:

	1885.	1884.	Inc. or Dec.	P. c.
Interior markets:				
Receipts.....	10,624	3,896	I. 6,728	172.5
Shipments.....	9,890	4,329	I. 5,561	128.4
Stock, Aug. 28.....	20,173	16,342	I. 3,831	23.5
Seaports:				
Receipts.....	11,695	4,914	I. 6,781	139.6
Exports	12,881	17,078	D. 4,197	24.7
Stock, Aug. 28	128,523	124,492	I. 4,031	3.2

The cotton year closed Aug. 31, but it will probably be a week or two yet before the full statistics for the year can be made up.

Southern Railway & Steamship Association.

The Arbitrators, Messrs. John Screven, Thomas H. Carter and E. K. Sibley, to whom was submitted, under agreement between the Virginia, Tennessee & Georgia Air Line and the Louisville & Nashville, the question of divisions of traffic from eastern cities to Nashville and Memphis, announce their decision and award as follows:

	To Nashville.	To Memphis.
Va., Tenn. & Ga. Air Line	55 per cent.	57 per cent.
Louisville & Nashville.....	45 " "	43 " "

The case was submitted to the Board of Arbitrators at Chicago, Aug. 26 and 27, when the arguments of both lines were made.

Tobacco Rates.

It is announced that rates on unmanufactured tobacco in hogsheads and cases have been fixed at 33 cents per 100 lbs. from Missouri River points to New York; 28 cents from Chicago, 30 cents from Evansville, and 25 cents from Jeffersonville and New Albany. This is an increase of about 15 per cent. The new rates take effect Sept. 1.

Southern Passenger Rates.

The East Tennessee, Virginia & Georgia is reported to be cutting passenger rates extensively from New York to Southern and Southwestern points, and the cuts have been followed to some extent by the Louisville & Nashville and the Richmond & Danville lines. Some efforts are being made to bring about a settlement.

East-bound Rates.

The effort to maintain east-bound rates on basis of 20 cents for grain from Chicago to New York has not proved very successful. There have been reports of cutting all along, and on Aug. 28 they ceased to be merely reports and grain was openly taken at 15 cents and provisions at 20 cents. Even this reduction has not proved sufficient, and it is stated that contracts for large quantities of freight have been taken at from 12½ to 14 cents to New York for grain and 17½ cents for provisions. It is charged that this cutting is the result of the action of the lines at Peoria and St. Louis, which have made no efforts to maintain rates, while the Chicago lines did for a time honestly endeavor to keep up the 20 cent rate.

Lake Superior Iron Ore.

Shipments of iron ore from the Lake Superior region from the opening up to Aug. 27 are reported by the Marquette *Mining Journal* as follows, in tons:

	1885.	1884.	Inc. or Dec.	P. c.
From L'Anse.....	19,136	48 541	D. 29,405	60.4
From Marquette	426.632	609.301	D. 182,669	29 9
From Escanaba.....	785,863	1,040,198	D. 254,335	24.3
From St. Ignace	57,481	35.921	I. 21,560	59.9
Total..... 1,289,112		1,733,961	D. 444,849	25.7

Of the Escanaba shipments this year 341,741 tons were from the Marquette District, and 444,122 from the Menominee District.

Pig-iron shipments were 3,395 tons from Marquette and 3,546 from St. Ignace; 6,941 tons in all.

Passenger Commissions.

A circular from the Grand Trunk Co., addressed to agents on the Erie road, states that an arrangement has been arrived at between the two companies by which the payment of commissions on tickets sold is discontinued from Sept. 1.

Buffalo Grain Traffic.

Buffalo grain receipts by lake from the opening to Aug. 31 have been as follows for four years past, flour in barrels and grain in bushels, flour reduced to wheat in the totals:

	1885.	1884.	1883.	1882.
Flour.....	1,182,458	1,295,800	1,261,291	996,888
Grain..... ...28,465,880		26,385,543	35,711,848	27,509,385
Total, bu..34,378,170		32,864,543	42.01e,303	32,403,825

Shipments east of grain received by lake for the same period were, in bushels:

	1885.	1884.	1883.	1882.
By canal....18,54⅓,330		19,200,558	14,836,417	16.904,539
By rail.....	7,122,342	5,564,198	8,131,410	6,753,161
Total.....25,667,702		24,764,756	22,967,827	23,657,700
P. c. by rail.	27.7	22.5	35.4	28.5

The canal opened May 11 this year; May 7 last year; May 7 in 1883, and May 11 in 1882, or at nearly the same date in each year.

OLD AND NEW ROADS.

Annapolis & Elkridge.—In accordance with the decree of the Court, this road was surrendered to the trustees under the first mortgage on Aug. 29. The matter has been in litigation for several years and was carried up into the Maryland Court of Appeals. The road extends from Annapolis, Md., to Annapolis Junction on the Baltimore & Ohio, 20½ miles. It was at one time purchased by the Baltimore & Drum Point Co., but the sale was never completed. The larger part of the capital stock is owned by the state of Maryland.

Atchison, Topeka & Santa Fe.—This company's statement for July and the seven months to July 31 is as follows:

	July.		Seven months.	
	1885.	1884.	1885.	1884.
Miles of road.....	2,375	2,377	2.375	2,322
Earnings.....$1,181,784		$1,301,639	$8,409,040	$8,948,454
Expenses.....	646,711	817,866	4,759,038	4,928,741
Net earnings ...	$535,073	$483,773	$3,650.002	$4,019,713

For the seven months the gross earnings decreased $539,414, or 6 per cent., and the expenses $169,703, or 3.4 per cent., leaving a decrease of $369,711, or 9.2 per cent., in net earnings.

Augusta, Gibson & Sandersville.—Track on this road is now laid to Glover's, Ga., 41 miles southwest from Augusta, leaving only 9 miles to compiete the road to Gibson.

Buffalo, New York & Philadelphia.—The interest due Sept. 1 on the second-mortgage bonds was not paid. All the interest previously defaulted on these bonds has been paid up, and it is said that the Receiver will as soon as possible pay the September coupons, and also the July coupons on the first-mortgage bonds, which were not paid when due.

California Southern.—The Boston *Transcript* says: "All but about $65,000 of California Southern Railroad bonds have assented to the reorganization plan, and it is understood that the reorganization will be effected in such a manner that outstanding bonds will stand small hope of securing any additional advantages. The present mortgage bonds of $25,000 per mile, which are being surrendered in the reorganization scheme, together with new bonds of $25,000 per mile upon the 84-mile extension to the Atlantic & Pacific, will be used as collateral for the new bonds of $10,000 per mile to issue to the Atchison Co. for the construction of the extension, and also for the income bonds to be issued at the rate of $15,000 per mile in exchange for the old first-mortgage bonds surrendered. It is expected that the new income bonds will be issued in the latter part of October."

Cape Girardeau Southwestern.—A bill has been filed in the United States Circuit Court in Missouri against the Illinois, Missouri & Texas Railroad Co., the Cape Girardeau & State Line Railroad, George C. Thilenius and Henry T. Blow, trustees; Thomas C. Fletcher and the Cape Girardeau Southwestern Railroad Co., praying for the appointment of a receiver to the end that the profits be used for the payment of the principal and interest on $1,800,000 first-mortgage construction bonds and interest coupons issued by the Illinois, Missouri & Texas Co., which at one time undertook the construction of the road, then known as the Cape Giradeau & State Line. These bonds, we believe, are not acknowledged by the present company, and a suit is brought to enforce their validity.

Central Iowa.—It is stated that this company is about to build in the northern part of Iowa a 17-mile line from Manly Junction to Monawhich will give the company a direct connection with the new Minnesota & Northwestern road.

Chautauqua Lake.—This company was organized at Jamestown, N. Y., Aug. 27, to construct a standard gauge railroad on the shore of Lake Chautauqua, from Jamestown to Mayville. On the same day a corps of engineers started a preliminary survey around the lake. On Aug. 29 a contract was made with Thos. B. Inness, of New York, for the construction and equipment of the road. Grading will be commenced about Sept. 15.

Chicago & Alton.—The latest Chicago report is that, in retaliation for the proposed extension of the Milwaukee & St. Paul to Kansas City, this company will build an extension of its road from Lacon, Ill., the terminus of a branch of the line, through Illinois and Southern Iowa to Council Bluffs. This rests upon rumor entirely, however, and it does not appear probable that so conservative a corporation as this has always been would undertake to build so long and expensive a parallel line without better cause than has yet been presented.

Chicago, Burlington & Northern.—The formal articles of incorporation of this company have been filed in Illinois, Minnesota and Wisconsin, and the company is now fully organized.

The contractors, E. P. Reynolds & Co., who have taken the grading of the line from Oregon, Ill., to the Wisconsin River, are now subletting sections of the line. It is said, however, that the prices offered by them are so low that a number of the small contractors who had intended to take sections declined to take any of the work. A number of the sections have, however, been let, and some of the contractors have already begun work.

Chicago & Great Southern.—It is understood that a syndicate has been formed in Chicago to buy this road at the approaching foreclosure sale, the intention being to extend the road from its present terminus at Yeddo, Ind., southward to Brazil, a distance of about 40 miles, the object being, of course, to make a new connection between Chicago and the Indiana block coal region.

Chicago & Northwestern.—This company reduces its quarterly dividend on the preferred stock from 2 to 1¾ per cent. In relation to this change officers of the company authorize the following statement: "The change in the dividend does not arise from any decline or loss in the business and profits of the company. The two months, June and July, of the present fiscal year show better net results than during the same period last year. The change is made as a part of the conservative policy of the company. It is desirable to keep the affairs of the company in good shape and its finances strong, and to increase the surplus of the net earnings as a guarantee for the future. In the present condition of investments the payment of 7 per cent. on the preferred and 6 per cent. on the common stock will afford a good return to stockholders, and will not depreciate the value of the property."

A Chicago report has it that this company will certainly build a line to Kansas City if the Milwaukee & St. Paul carries out its reported intention of building to that point. No positive statement can be obtained from the company.

Denver & New Orleans.—A suit is brought in the United States Circuit Court, at Denver, Col., by Charles Lanier and others, of New York, against the Denver & New Orleans Railroad Co., the Denver & New Orleans Construction Co., the Denver, Texas & Gulf Railway Co., and others. The complainants allege that they hold $100,000 worth of notes of the Denver & New Orleans Construction Co., which are secured by stock and bonds of the Denver & New Orleans Railroad Co. They bring suit to prevent the defendants from disposing of any of the property or stock or bonds of either of the last-named companies, or either of the individuals, to the Denver, Texas & Gulf Railway Co., and ask that a perpetual injunction be issued restraining them from so doing.

Denver & Rio Grande.—The reorganization committee, of which Mr. Coppell is chairman, are informed that $4,500,000 Denver & Rio Grande Railroad consols have been deposited in London, and that the Stock Exchange of that city has listed them and authorized a quotation.

East Tennessee, Virginia & Georgia.—The statement for July, the first month of the fiscal year, is as follows:

	1885.	1884.	Inc. or Dec.	P. c.
Earnings.....$298,824		$278,037	I. $20,787	7.5
Expenses	167,496	187,876	D. 20,380	10.8
Net earnings.....$131,328		$90,161	I. $41,167	45.7

The reduction in expenses on a large increase in business is reported as due in great measure to the improved condition of road and equipment.

Fort Worth & Denver City.—This company's statement for July and the nine months of the fiscal year from Nov. 1 to July 31 is as follows:

	July.		Nine months.	
	1885.	1884.	1884-85.	1883-84.
Earnings.....	$49,067	$50,359	$322.420	$360,340
Expenses.....	26,310	23,920	177,910	204,890
Net earnings.....	$22,757	$26,439	$144,510	$155,450

For the nine months the gross earnings decreased $37,920, or 10.5 per cent., and the expenses $26,980, or 13.2 per cent., the result being a decrease of $10,940, or 7.0 per cent. in net earnings. The road worked was 144 miles for July and 121 miles for the nine months, against 110 miles for both periods last year.

Galveston, Sabine & St. Louis.—This road has been transferred to an organization known as the Galveston & St. Louis Construction Co. The road extends from Longview, Tex., to Mineral Springs, 24 miles, and is built for the purpose of reaching the lumber belt. The new owners agree to pay off the floating debt, put the road in good condition, and extend it to Carthage.

Grand Trunk.—The drilling party at the experimental work of the projected tunnel under the St. Clair River at Port Huron, now in progress by this company, have finished four test shafts and are now at work on the fifth. The indications still continue favorable, the material found being stiff clay with rock at the same depth of about 90 ft. below water level.

Gulf, Colorado & Santa Fe.—The strike of the shop employés on this road reached a crisis on Aug. 30, when an attempt was made at Galveston by the officers of the company, assisted by the sheriff, to break the blockade and start out freight trains over the road. At one time it appeared as though a conflict was inevitable, but the strikers finally gave way, and a conference was hastily arranged between a committee of their number and officers of the company. At this conference it was agreed that the men should resume work at once, and all matters in dispute between them to be submitted to arbitration, and both parties agreeing to abide by the result of the arbitration. Work was accordingly resumed the next day.

Houston, East & West Texas.—Under the authority given by the Courts in both Texas and Louisiana, work has been resumed on this road. On the Texas end the grading is being finished up and track laying has been resumed. On the Louisiana end, where the grading is about completed, the rails are being laid as fast as possible and the track has already reached a point 7 miles beyond the old terminus at Keachi, and 30 miles from Shreveport, leaving only 8 miles to reach Logansport, which will probably take some time.

Illinois Central.—Officers of this company deny current rumors that they are negotiating for the purchase of the new Minnesota & Northwestern road. They say that, while they will exchange business with the new road on equitable terms, they have no desire to control it, nor to enter into any more active competition than at present on St. Paul business.

A Chicago dispatch reports that this company is consider-

ing plans for a new passenger station in that city for the use of its own trains and those of the Michigan Central road.

Jacksonville, Tampa & Key West.—Tracklaying has been begun on the extension of this road from Palatka, Fla., to Sanford, and at latest accounts the rails were down for 5 miles. The grading is now substantially finished, so that there will be no delay, and it is expected that the road will reach Sanford by December.

Mr. M. R. Moran, General Passenger Agent of the road, announces that the line will certainly be completed to Sanford by Dec. 1, and asks connecting lines to put on sale tickets to all points on the line in time for the winter travel to Florida. The road will extend from Jacksonville to Sanford, 125 miles, and its trains will run that distance in 4½ hours, a saving of three-quarters of the time heretofore taken by the boats on the St. Johns River. The road will connect at Palatka and Astor with the Florida Southern; at West Tocoi with the St. Johns Railroad for St. Augustine; at Blue Springs for New Smyrna; at Enterprise for Titusville, on Indian River, and at Sanford with the South Florida road for Tampa.

Kansas City & Southern.—The first passenger train over the extension of this road was run on Aug. 27, from Clinton, Mo., to East Lyon, 38 miles, and regular trains will be put upon this section in a few days. The stations have been located and buildings are now being erected. Work is progressing actively on the incomplete sections of the road.

Lackawanna & Pittsburgh.—Some months ago the employés of this road struck, and then succeeded in getting part of the back pay due them, and afterward resumed work. They again struck for the same cause on the night of Aug. 31, and all traffic over the road is suspended. There is from six to seven months' pay due, and there is very little prospect of a re-opening of the road unless the Receiver succeeds in raising some money.

LaFayette, Newtown & Wabash River.—This company has filed articles of incorporation to build a railroad from LaFayette, Ind., by way of Newtown, to Terre Haute, a distance of 82 miles. The capital stock is fixed at $1,000,000.

Lake Erie & Western.—The Central Trust Co., of New York, has filed a bill in the United States Circuit Court to foreclose the LaFayette, Bloomington & Muncie mortgage. This mortgage covers the road from Bloomington, Ill., to Muncie, 201 miles, and is for $2,500,000. The complaint makes the usual allegations that interest is due and unpaid, and that the road is already in possession of a receiver and the company insolvent.

Lookout Mountain.—Work has at last been begun on the long-talked-of road from Chattanooga, Tenn., to the summit of Lookout Mountain. It has been decided to operate the road by a cable instead of by locomotive power, and the line adopted is a more direct one than the one first proposed when it was intended to use locomotives.

Louisville & Nashville.—This company's statement for July, the first month of the fiscal year, is as follows:

	1885.	1884.	Inc. or Dec.	P.c.
Earnings.....	$1,057,332	$1,060,104	D. $2,772	0.3
Expenses.....	695 887	624,871	I. 71,016	11.4
Net earnings..	$361,445	$435,233	D. $73,788	17.0

The increase in expenses was largely due to increased renewals. The expenditures for construction in July of this year were $20,974, leaving a balance of $340,471 for the month.

Marquette, Houghton & Ontonagon.—Negotiations are in progress between this company and the Mineral Range Railroad Co., which, it is expected, will result either in a lease or a traffic arrangement under which this company will control and operate the Mineral Range road. The last-named line extends from Hancock, Mich., to Calumet, 12½ miles serving the extensive copper-mining region in that vicinity. It is stated that a connection will be made between the two roads from Houghton to Hancock, including a bridge across Portage Lake, which at that point is very narrow, and that a third rail will be laid over the Mineral Range road, which is now 3-ft. gauge.

Massena Springs & Fort Covington.—The grading of this new road is now nearly finished from Fort Covington, N. Y., eastward to Bombay, and track laying has been begun. The line from Bombay to Massena Springs is not yet located. Two routes have been surveyed, but neither has been finally adopted as yet and the decision of the question apparently depends upon the amount of local aid which can be secured.

Memphis & Charleston.—This company's statement for July, the first month of the fiscal year, is as follows:

	1885.	1884.	Decrease.	P. c.
Earnings.....	$83,816	$105,471	$21.655	20.1
Expenses	68,740	73,730	4,990	6.6
Net earnings.....	$15,076	$31,741	$16,665	52.6

It may be noted that this company resumes the publication of its earnings, after stopping it for several months, at a time when the reports make a particularly unfavorable showing, which is contrary to the usual practice.

Memphis, Oxford & Columbus.—The survey of this projected line from Oxford, Miss., to Columbus has been completed, and arrangements are now being made to begin work on the road.

Minnesota & Northwestern.—It is stated that this company has concluded a traffic contract with the Central Iowa Co., under which the Central Iowa will be its chief southern and eastern connection. The agreement requires the building of a short connecting line from Manly Junction, Ia., to Mona, Minn., to enable the new line to reach the Central Iowa by its own tracks.

Montreal & Sorel.—This road, which extends along the south side of the St. Lawrence from a point opposite Montreal to Sorel, P. Q., 40 miles, has not been operated for some time. Recently, however, several towns on the line voted subscriptions in aid of the company, and the road is now being put in good order and trains will be put on as soon as the repairs are completed.

New London Northern.—This company has sold to W. P. Hatch & Co., of New York, $300,000 in new 4 per cent. bonds at par. The new bonds will take the place of the old first-mortgage 6s, which matured during the present month.

New York, Chicago & St. Louis.—The reports to the New York State Commission give the following figures for the quarter ending June 30 and the half-year to the same date:

	Quarter.		Half-year.	
	1885.	1884.	1885.	1884.
Earnings	$683,964	$737.385	$1,480,899	$1,516,681
Expenses.....	544,782	562,835	1,109,340	1,119,878
Net earnings.....	$139,182	$174,550	$371,559	$396,803
Rentals, taxes, ets..	104,779	45,000	526,406	403,527
Surplus or deficit.	S. $34,403	S.$129,550	D.$154,847	D.$6,724

For the quarter the statement (made by the Receiver) does not include any charge for interest on bonds. For the first quarter the report did include that interest, so that the charges given above for the six months represent only about one-half the amount actually accruing, but not paid.

New York, Lake Erie & Western.—This company's statement for July and the ten months of the fiscal year from Oct. 1 to July 31 is as follows, the figures including 68 per cent. of the gross earnings and the entire working expenses of the leased New York, Pennsylvania & Ohio road:

	July.		Ten months.	
	1885.	1884.	1884-85.	1883-84.
Earnings.....	$1,561,721	$1,784,638	$15,361,450	$17,671,846
Expenses.....	1,191,166	1,343,336	11,855.448	13,921,341
Net earn ..	$370,555	$441,302	$3,506,002	$3,750,505

The ten months show a decrease in gross earnings of $2,310,396, or 13.6 per cent., with a decrease in expenses of $2,062,893, or 15.8 per cent., leaving a decrease in net earnings of $244,503, or 12.4 per cent

The earnings of the Erie lines proper, excluding the New York, Pennsylvania & Ohio, were:

	July.		Ten months.	
	1885.	1884.	1884 85.	1883-84.
Earnings	$1,308.180	$1,458,186	$12,547,732	$14,351.811
Expenses.....	878.779	1,007.307	8,865,710	10,269,772
Net earn....	$429,401	$450,879	$3,632,022	$4,081,039

For the ten months the gross earnings decreased $1,804,079, or 12.6 per cent., and the expenses $1,404,062, or 13.7 per cent., leaving a decrease of $400,017, or 9.8 per cent., in net earnings.

A comparison of the two statements shows that the 68 per cent. of gross earnings of the leased line for the ten months amounted to $2,813,718, and its working expenses to $2,989,738, showing a loss on the lease of $176,020, against a corresponding loss of $331,534 last year.

New York & New England.—The directors have passed a resolution to the effect that the option to exchange car-trust certificates for second-mortgage bonds shall terminate on Sept. 19. It was also resolved that on that date the balance of second-mortgage bonds deposited with the American Loan & Trust Co. for exchange shall be withdrawn.

The Receiver's statements give the following figures for July and the ten months of the fiscal year from Oct. 1 to July 31:

	July.		Ten months.	
	1885.	1884.	1884-85.	1883-84.
Earnings....	$296,112	$276 217	$2,610,488	$2,755,469
Expenses.....	186,223	221.126	1,836,874	2,377,575
Net earnings..	$109,889	$55,091	$773,614	$377,894

The gross earnings for the month show a gain for the first time in over a year. For the ten months the gross earnings decreased $144,981, or 5.3 per cent., and the expenses $540,701, or 22.8 per cent., leaving a gain of $395,720, or 104.7 per cent., in net earnings.

New York, Ontario & Western.—For some time past it has been understood that Mr. Edward D. Adams, of the firm of Winslow, Lanier & Co., has held an option on $1,250,000 of the preferred stock of this company at 82½. As there is only $2,000,000 of preferred stock, and as the preferred stockholders elect 8 of the 13 directors of the company, the ownership of this amount gives the control of the board. The option expired Aug. 25, and on that day Mr. Adams exercised it. The stock thus called in will be paid for in certificates of indebtedness exchangeable for the new West Shore 4 per cent. bonds guaranteed by the New York Central, so that the control of the Ontario & Western will pass to the New York Central Co. with that of the West Shore road. The West Shore and the Ontario & Western interests are so closely joined in many matters that the control of this road appears to have been an essential part of the settlement.

The statements to the New York Railroad Commission give the following figures for the quarter ending June 30 and the half year ending the same date:

	Quarter.		Half-year.	
	1885.	1884.	1885	1884
Earnings	$451,256	$465,375	$845,755	$827.705
Expenses.....	408,219	396,394	787.429	786 821
Net earnings	$43,037	$68,981	$58,326	$40,884
Other income ...	24,356	18,432	48,697	34,344
Total.....	$67.393	$87,413	$107.023	$75,228
Taxes, rentals, etc.	112,357	81,717	226,258	204,441
Surplus or def.	D. $44,964	S. $5,696	D. $119,235	D. $129,213

The balance sheet shows that on June 30 the company had $12?,000 funded and $2,009,326 floating debt. The cash and accounts receivable amounted to $1,196,136, leaving a balance of $813,190 floating debt.

New York, Texas & Mexican.—This road has been sold to the Southern Pacific Co., and will hereafter be operated by that company. It is completed from Rosenburg Junction, Tex., to Victoria, 92 miles, and will be operated in connection with the Gulf, West Texas & Pacific road, which is controlled by the Southern Pacific Co. through its lease with the Morgan line. The New York, Texas & Mexican road was intended to run from Rosenburg to Brownsville, about 300 miles, but all construction was stopped after it had been completed to Victoria.

New York, West Shore & Buffalo.—Mr. Ashbel Green, Receiver of the North River Construction Co., notifies all persons holding or claiming interests in the stock of that company, to file with him before Sept. 9 their claims to such interest.

Norfolk & Western.—This company's statement for July and the seven months to July 31 is as follows:

	July.		Seven months.	
	1885.	1884.	1885.	1884
Earnings.	$210,268	$185,824	$1,447,297	$1,432,327
Expenses.....	139,906	109,501	931,243	897,255
Net earnings.....	$70,362	$76,323	$516,054	$535,072
Per cent. of exps....	66	59	64	63

Expenses include taxes. For the seven months the gross earnings increased $14,970, or 1 per cent., and the expenses $33,988, or 4 per cent., the result being a decrease in net earnings of $19,018, or 3.4 per cent. The statement says:

"The increased expenses in July, 1885, as compared with July, 1884, were due to the increase in the movement of low-class freights (the mileage of all freights in July, 1885, being about 2½ times that of July, 1884), and to the fact that during the summer months of 1884 the work of repairs and renewals was reduced to the minimum of current necessity, whereas during the present season, in anticipation of the expected heavy cattle, coal and cotton business of the latter part of the year, repairs and renewals have been continuously made and charged currently to expenses."

Northern Pacific.—A number of rumors are current as to the coming annual meeting, but nothing definite is known. It is understood that a large number of proxies have been secured for the present management, but there is still a considerable amount of the stock unaccounted for, and a number of changes in the board of directors are thought to be possible.

Ohio & Mississippi.—In a report issued in London recently the London Committee of the common shareholders say: "On July 30 of last year the committee issued a report and asked the stockholders for their proxies for the then approaching election of directors. What took place at that time was referred to very generally in the press, and no necessity arose for the committee to address the shareholders specially on the subject. The result of the compromise was the election of two of the committee's nominees, and the placing of Messrs. Morison and Smith on the Executive Committee. The arrangements effecting this having been completed, it devolved on the board to carry on the business of the road in the best manner possible. A certain amount of floating debt remained to be provided for, and as was to be expected in the case of a road with few capital resources, difficulties arose in the early part of this year in providing for the current interest on the bonds as it fell due. Thanks, however, to the care and judgment of the directors, an arrangement was made on April 2, 1885, whereby all the fixed charges of the road for the year were practically provided for, and at the same time the gentlemen to be elected on the board at this coming October election were decided on. Four vacancies occur, and the names of the gentlemen agreed on between Mr. Garrett, representing the Baltimore & Ohio, and the directors representing your committee are as follows: A. Gracie King, of Messrs. James G. King & Sons; George C. Magoun, of Messrs. Kidder, Peabody & Co.; Charles R. Flint, of Messrs W. R. Grace & Co., and James Renwick. The names speak for themselves, and must be well known to many of the stockholders. When elected, the new directors will doubtless work in accord with the committee's present representatives, and the Ohio & Mississippi will then be managed and controlled by directors nominated by, and acting independently in the interests of the shareholders alone. * * *

"It remains only for the committee to refer to the statements that have been made with regard to negotiations for a lease of your road to the Baltimore & Ohio Co. Fully appreciating the importance to both lines of close and friendly alliance between them, the committee have always kept in view the desirability of coming to some permanent agreement with the Baltimore & Ohio, and with this object the committee have for a long time been in written communication with Mr. Garrett. Lately Mr. Garrett has been in London, and some influential shareholders and the Chairman of the committee have seen him. Mr. Garrett has approached the subject with the evident desire to bring about a settlement, and the shareholders may rest assured the committee will do everything in their power in furthering any reasonable arrangement."

Oregon Improvement Co.—The Boston *Transcript* reports: "The proposal to issue 10 per cent. second-mortgage bonds to fund the Oregon Improvement Co.'s floating debt has been negatived, and the directors have authorized a second mortgage of $1,200,000, bearing 8 per cent. interest, of which nearly $800,000 will be used to pay the company's floating debt, and the remainder will be in the treasury of the company. The bonds will have 10 years to run, but the company will have the option of prepaying them."

Oregon Railway & Navigation Co.—The Boston *Herald* of Sept. 1 says: "This company is having the best season in its history. Traffic is heavy, and the economies inaugurated by President Elijah Smith on his late trip to Oregon make the net receipts equally large. The western office forwarded $120,000 East last week, and $100,000 more is now on the way. There have been $600,000 net receipts sent forward in five or six months. August is expected to show at least $150,000 net, and September as much or more. The new consolidated 5 per cent. bonds are being engraved. Not over $3,000,000 will be sold at first. The 6s cannot be paid. The $1,200,000 of 8 per cent. scrip can be paid in November. The $1,000,000, more or less, borrowed on the debenture 7s against advances for Baker City extension work, will be paid with proceeds from the sale of the 5s, and $500,000 will be put into improvements. The company pays 3½ to 4 per cent. for money on the debenture 7s as collateral, hypothecating them at 80 and 90, the market price being about 102. The company expects to show 6 per cent. on the stock for the new fiscal year, but hardly for the calendar year, January and February having been very poor months."

The terms of the proposed lease of the company's property have been made public. The papers for the proposed lease, although consisting of only two articles, cover 43 pages of printed matter. After devoting eight pages to a protracted memorandum of the possessions and indebtedness of the Oregon Railway & Navigation Co., in which the only items of interest are that there are 657.3 miles of constructed road, $6,000,000 of first-mortgage bonds, $1,200,000 of scrip certificates, and $5,000,000 of debentures outstanding, and that the road contemplates the issue at a rate not exceeding $25,000 per mile of road of new consolidated 5s., dated June 1, of this year, and payable within 40 years, Article I provides that the road and all its belongings be leased to the Northern Pacific, the Union Pacific and the Oregon Short Line companies for the period of 999 years, the considerations being a cash transfer of $1 and an agreement to fulfill certain provisions.

The Oregon Co. in the fifth section states that its indebtedness amounts to $12,200,000 and the yet untried claims of the Bethlehem Iron Works, the Oregon Transcontinental and the Oregonian Railway companies, amounting to less than $800,000. Under the lease $16,432,500 of consolidated 5s are to be issued, which section 6 provides shall be used as follows: To cancel the first-mortgage bonds, the scrip certificates and the debentures, $12,200,000. Another million is to be set aside to meet the contested claims mentioned above should the courts rule adversely, and the balance of the issue is to be devoted to improvements of the road and its rolling stock. Should the $6,000,000 of first-mortgage bonds not be taken up by July 1, 1887, the new issue of consolidated 5s to a like amount are to be deposited with the Farmers' Loan & Trust Co., of New York, as Trustee. Article II provides that the annual rental for the leased property to the amount of $1,200,000 shall be paid for each of the first three years, and $1,440,000 for each of all the ensuing years of the lease, the first semi-annual payment of $600,000 being due on Jan. 1 next. It is also further provided that until the $6,000,000 of the first mortgage has been redeemed, 6 per cent. interest in gold is to be paid on these securities, January and July being the months for these expenditures. The $1,200,000 scrip certificates are to draw 8 per cent. interest in lawful money, the first payment to be made next November, two-thirds by the lessees and one-third by the lessor. The debentures, amounting to $5,000,000, are to receive 7 per cent. interest in gold, the first payment due next October, and the lessees and the lessor sharing equally in the expense. The new consolidated 5s are to have their interest paid in gold in June and December of each year.

The Northern Pacific Railroad and its partners in the lease are required to maintain and operate the Oregon road, providing for all repairs, alterations and extensions, and are empowered to use the present property in any way they may deem most expedient. They are also to meet all expenses, costs, damages or other claims which may arise in the future without deduction from the agreed rental, and make all

the required payments to the sinking fund. In brief, the Oregon road becomes a part of the Northern Pacific's system, and the latter assumes the former's obligations and guarantees its fixed charges. The lease is to terminate by the default for 90 days in any of the covenants by either party to the indenture.

Pennsylvania.—This company's Ridgway & Clearfield branch is now completed to Falls Creek, Pa., on the Low Grade Division of the Allegheny Valley road, 10 miles southward from the late terminus at Brockwayville and 29½ miles from the connection with the Philadelphia & Erie at Ridgway Junction.

Pittsburgh & Lake Erie.—A report comes from Pittsburgh that the controlling interest in this road, owned by Mr. Vanderbilt, has been or is to be transferred to the Pennsylvania Railroad Co. as part of the settlement between that company and the New York Central. The reports are not confirmed, and the most that can be said is that such a transfer is not impossible, and indeed not improbable. The road is a valuable property and its possession would be of considerable advantage to the Pennsylvania.

Portland & Ogdensburg.—The bill providing for the reorganization of this company by the bondholders has passed the New Hampshire Legislature and has become a law. The bill authorizes the new company to build the extension from Fabyan, N. H., to the Vermont line. It is not at all likely, however, that this extension will be built as long as the St. Johnsbury & Lake Champlain road is under control of the Boston & Lowell.

Pottsville & Mahanoy.—The *Coal Trade Journal* thus describes this new road: "The new line known as the Pottsville & Mahanoy Railroad, is destined to open up a section of anthracite coal country that has hitherto been almost entirely usurped by the operations of other companies. The Schuylkill Valley Railroad, an offspring of the Pennsylvania, runs parallel with the Philadelphia & Reading line from Philadelphia to Pottsville, where it enters the First or South Anthracite region, at which point the Pottsville & Mahanoy extension commences. The surveyed route crosses the Broad Mountain in the vicinity of New Boston, thence to Mahanoy City and to Delano, in the Middle or Second Anthracite region; thence across the central part of the Beaver Meadow coal fields from Tresckow to Jeanesville, and thence reaching Hazleton through the gorge or depression in the south boundary of the Hazleton coal field. It then traverses the high ground about the western end of Wyoming street, Hazleton borough, crosses Cranberry Creek and follows down the side of that stream to near its junction with Black Creek; still continuing down the western and southern side of Black Creek past the Black Ridge coal works to Tombicken, where the Hazleton Division of the Lehigh Valley Railroad intersects it where it crosses the Black Creek and joins the Sunbury, Hazleton & Wilkes-Barre Railroad, owned by the Pennsylvania Railroad Co., following it through Derringer and Fern Dale coal works to Gowen collieries at the western end of Black Creek coal basin, where, or near where, the surveyed route crosses to the eastern side of Black Creek, and goes through the gap of Buck Mountain into the lower Black Creek farming valley. It follows Black Creek across the valley and passes through the gap of Nescopec Mountain, where it will follow its northern slope eastward to Wapwallopen and the Susquehanna River and there connect with the Pennsylvania Railroad running up the Susquehanna from Sunbury to the company's coal lands near Shickshinny, at the western end of the Wyoming or Third Anthracite region."

Quincy, Missouri & Pacific.—Notice is given that a decree of foreclosure will probably be granted against this road during the present month. All bondholders are requested to join in the reorganization by signing the agreement and depositing their bonds with the Central Trust Co. in New York.

Rome, Watertown & Ogdensburg.—This company has leased the newly built Syracuse, Phœnix & Oswego road, and will commence running trains over it on Monday, Sept. 7.

St. Joseph & Grand Island.—It is announced that the securities of this new company are now ready for issue, and that holders of Central Trust Co. certificates, issued upon deposits of St. Joseph & Western stock bonds, can exchange them for the new stock bonds to which they are entitled.

St. Paul, Minneapolis & Manitoba.—The St. Paul *Pioneer-Press* says: "A morning paper which recently took advantage of the temporary absence of President Stickney, of the Minnesota & Northwestern, to sell his road for him, has now engaged in the enterprise of building imaginary railroads for President Hill, of the Manitoba. It seizes upon the incident of a party of surveyors arriving at Crookston, to survey a line east of that point, to build up a vast system of speculative extensions for the Manitoba, extending from Duluth to Crookston, and thence westward to the Upper Falls of the Missouri. It has been a subject of speculation for years that the Manitoba would eventually extend its line from Devil's Lake to the Falls of the Missouri, in which Mr. Hill owns a controlling interest; but how much probability there is that Mr. Hill has any present purpose to extend his railroad in that direction may be inferred, said a leading Manitoba official yesterday, from the fact that for two-thirds of the distance the road would run through conceded Indian territory, where no white man can settle, and that, except a few scattering settlers on Mouse River, and between it and Devil's Lake, there is no settlement on the ceded portion of the territory which such a line would traverse, to justify its construction. As this official expressed it: 'If some one should build a road to the Falls of the Missouri and present it to us, we could not afford to operate it.' Whatever views Mr. Hill may entertain for the future, these facts would indicate that he has no present purpose of pushing his line through that region. The only basis of fact for these speculations, according to the same high authority, is that the Manitoba Co. has detailed a party of surveyors to survey a line eastward from Crookston to Leech Lake. Whether the line will be built depends largely upon the reports of the surveyors as to the practicability of the route and the character of the country. Its primary object is to give the pine region a direct outlet upon the Red River Valley. Speculation is premature as to where the road will run then. Mr. Hill himself has formed no definite plans. Anybody is at liberty to guess that he may intend to extend it directly to Duluth. Whatever his purposes in that direction, he is likely to build southward from Leech Lake to a connection with the branch of the Manitoba running northward from Sauk Centre. This information was confidentially communicated to the *Pioneer-Press* some days ago from official sources; but the only step actually decided upon was to survey a line from Crookston to Leech Lake, and to build that line, if practicable, as an outlet for the pineries of the Red River Valley. Farther than that the policy of the company has not been definitely decided upon, and largely depends upon circumstances. There is no foundation for the conjecture that there is any understanding between the Manitoba officials and the Duluth & Winnipeg or the Brainerd & Northwestern."

Sault Ste. Marie & St. Ignace.—It is proposed to build a railroad from Sault Ste. Marie, Mich., to St. Ignace, and an effort is to be made to work up support for the project along the line. The distance is 63 miles through a good country, much of which is already settled.

Southern Maryland.—The Maryland Circuit Court has granted a decree of foreclosure and sale against this road, at the suit of the Central Trust Co., of New York. The decree provides that unless all arrears of interest are paid up within 30 days, the road shall be sold, after due advertising, and appoints Anthony M. Zane trustee, to make the sale. The road was intended to run from Washington to a point on the Potomac near Point Lookout. It is completed from Brandywine, Md., to Mechanicsville, 20 miles. The funded debt amounts to $1,630,000 in first-mortgage bonds, on which no interest has been paid since 1881.

South Pennsylvania.—The temporary injunction granted at the suit of the Attorney-General of Pennsylvania, to prevent the transfer of this road, has been duly served upon the officers of the company. Counsel of the Pennsylvania Railroad Co. are preparing the answer of that company to the complaint in the suit, but what the nature of the answer will be has not been made public.

It is announced that Mr. Carnegie and his friends, whose position has hitherto been somewhat doubtful, have decided to join with Mr. Vanderbilt in accepting the terms offered to the syndicate by the Pennsylvania Railroad. This leaves those parties who are directors in the Reading and Dr. Hostetter, of Pittsburgh, the only members of the syndicate actively opposed to the transfer of the road, and makes a large majority in favor of the transfer, its opponents owning about $4,000,000 out of the $15,000,000 represented in the syndicate.

The latest report is that work will not be entirely stopped upon the road, but that it will be continued, and that the road will be built, although, perhaps, it may not be finished so soon as originally intended. The Pennsylvania Railroad Co., it is said, believes that the new line will be of considerable advantage to it, not only as a second line from Pittsburgh to Harrisburg, but also as developing considerable local territory.

The American Construction Co., the general contractor for the road, has induced nearly all the sub-contractors to assign their contracts. The assignee is to be a person to be named hereafter by the company.

Syracuse, Phenix & Oswego.—This road has been leased to the Rome, Watertown & Ogdensburg Co., and that company will commence to operate it Sept. 7. The road is 16 miles long, extending from Fulton, N. Y., southward to Woodwards. From Woodwards to Syracuse, 6 miles, trains will run on the Rome, Watertown & Ogdensburg track, and from Fulton to Oswego, 12 miles, on the New York, Ontario & Western track. The Rome, Watertown & Ogdensburg by this lease secures a second connection with Syracuse by way of Oswego.

Texas & St. Louis.—Another circular has been issued looking to the reorganization of this company. Lewis S. Wolff, of Kuhn, Loeb & Co.; William Mertens, of L. von Hoffman & Co.; George Coppell, M. Gernsheim, and J. W. Paramore state that they have become a committee to protect the interests of such holders of Texas and St. Louis securities as shall join in the plan, excluding, however, the land grant bonds and including the cash deposit certificates issued by the Readjustment Trustees under agreement dated Nov. 1, 1883. The committee claims to represent a majority in amount of the stock and bonds. Persons who desire to join in the plan must deposit their securities not later than Sept. 28 with the Farmers' Loan & Trust Co., of New York, which will deliver negotiable receipts in their place. The committee hopes to secure concerted action on the part of the holders of the various securities. The members say they are informed that the holders of the land grant bonds will have an opportunity to join a land company which it is proposed to organize.

Under this plan it is understood that holders of Texas Division bonds will receive 75 per cent. of their holdings in new second-mortgage bonds, and 25 per cent. in stock, while holders of Missouri & Arkansas Division bonds will receive 50 per cent. in bonds and 50 per cent. in stock.

The United States Circuit Court at Dallas, Tex., has made an order authorizing the issue of $185,000 of receiver's certificates. The certificates are for the payment of taxes in various counties, and the settlement of approved outstanding indebtedness of the road.

Wabash, St. Louis & Pacific.—The conference in New York last week between the committee of the Knights of Labor and the officers of this road resulted in a resumption of work in all the shops of the line where members of the organization had struck. No final settlement of the question at issue was made in New York, however, everything being postponed until the latter part of the present week, when the committee is to have a conference with General Manager Talmage in St. Louis. It is intimated, however, that there will probably be no difficulty in reaching a basis of settlement, as the New York conference was entirely friendly, and a disposition to compromise was shown on both sides.

Notice is given to the bondholders that the plan of reorganization, as adopted by the English bondholders, is to be carried out, if possible, and a formal agreement for carrying this plan into effect is now ready for signature of all bondholders who may desire to join. Messrs. James F. Joy, T. H. Hubbard, Edgar T. Welles and O. D. Ashley have been appointed Purchasing Committee for the purpose of carrying the agreement into effect, and have established an office at No. 195 Broadway, New York. Bondholders signing the agreement will be required to deposit their bonds with this committee, and will receive in exchange negotiable certificates from the Mercantile Trust Co., of New York. The committee state that signatures of holders of over $6,000,000 of consolidated bonds have already been received to the agreement. These include the English bondholders who have signed in London.

Waterloo, Decorah & Minnesota.—This company has filed articles of incorporation to build a railroad from Waterloo, Ia., north by east to Decorah and thence northeast to La Crosse, Wis., a distance of about 100 miles in all.

West Jersey.—This company's statement for July and the seven months to July 31 is as follows:

	July.		Seven months.	
	1885.	1884.	1885.	1884.
Earnings	$169,505	$178,532	$680,299	$706,042
Expenses	118,134	98,418	444,046	440,713
Net earnings	$51,371	$80,114	$236,253	$265,329
Interest, rentals, etc			159,742	166,135
Surplus			$76,511	$99,194

For the seven months the gross earnings decreased $25,743, or 3.6 per cent., and the expenses increased $3,333, or 0.8 per cent., the result being a decrease of $29,076, or 10.9 per cent., in net earnings. Charges decreased $6,393, or 3.9 per cent., leaving a decrease of $22,683, or 22.7 per cent., in surplus.

The stockholders of this company and of the Ocean City Railroad Co. have voted to approve an agreement for the consolidation of the two companies. The Ocean City Railroad extends from Ocean City, N. J., to Townsend's Inlet, 18¼ miles, and was completed about a year ago. The consolidation is purely formal, as the Ocean City road has always been operated as a branch of the West Jersey and all its capital stock was owned by that company.

Wisconsin Central.—A dispatch from Milwaukee, Aug. 30, says: "The Wisconsin Central has located all stations on its new line from Chicago to Schleisingerville, they being as given below, beginning at Chicago and going north: City Limits, Belt Line Railroad, Chicago & Great Western terminus, River Forest, Kolzes, Desplaines, Wheeling, Half Day, Holcomb's, Hainesville, Cedar Lake, Antioch, Silver Lake, Wheatland, Burlington, Honey Creek, Mukwanago, Vernon Centre, Waukesha, Duplaineville, Sussex, County Line, Richfield, Ackerville, Schleisingerville. The total distance between the terminal points of the new road, as shown by the station distances, is 122.22 miles. Contractors will begin construction work on the grade next week."

ANNUAL REPORTS.

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Wisconsin Central	432
Worcester, Nashua & Roch	7
York & Peachbottom	310

St. Paul, Minneapolis & Manitoba.

This company makes a brief statement for the year ending June 30 last, in advance of the publication of the full report. At the close of the year the company had 1,476 miles of road, an increase of 79 miles during the year.

The earnings were as follows:

	1884-85.	1883-84.	Decrease.	P.c.
Freight	$6,013,650	$6,114,460	$101,410	1.6
Passengers	1,418,556	1,662,431	223,875	13.5
Other	324,558	479,977	155,419	32.3
Total	$7,776,164	$8,256,868	$480,704	5.8
Expenses	3,509,927	3,929,393	419,466	10.7
Net earnings	$4,266,237	$4,327,475	$61,238	1.4
Gross earn. per m	5,415	5,992	577	9.6
Net " "	2,971	3,140	169	5.4
Per cent. of exps	45.1	47.6	2.5	...

The decrease in gross earnings was mainly due to the falling off in transportation of passengers and of construction material for the Canadian Pacific, of which large quantities were carried by this road in 1883-84.

The income account, as compared with the previous year, was as follows:

	1884-85.	1883-84.
Net earnings	$4,266,237	$4,327,475
Land Department	131,292	418,270
Miscellaneous	66,284	214,434
Total income	$4,463,813	$4,960,179
Interest	$1,980,200	$1,949,690
Sinking funds	131,292	418,270
Miscellaneous payments		381,545
Dividends	1,300,000	1,600,000
Total payments	$3,411,492	$4,349,505
Surplus for the year	$1,052,321	$610,674

The dividends paid last year amounted to 6½ per cent., against 8 per cent. in the previous year.

Pennsylvania Company.

This company, which is the organization through which the Pennsylvania Railroad Co. manages its lines west of Pittsburgh, operates directly the following roads:

	Miles
Pittsburgh, Fort Wayne & Chicago	468.3
Alliance, Niles & Ashtabula*	27.5
Massillon & Cleveland	12.2
New Brighton & New Castle*	12.5
New Castle & Beaver Valley	14.9
Lawrence	22.0
Ashtabula & Pittsburgh*	62.6
Erie & Pittsburgh	101.2
Cleveland & Pittsburgh	225.4
Northwestern Ohio*	85.7
Indianapolis & Vincennes	116.6
Jeffersonville, Madison & Indianapolis	204.1
Total	1,353.0

The roads marked with a * above, although worked nomi-

nally under lease, are wholly owned by this company. The only addition last year was the New Brighton & New Castle; the Meadville road was dropped, as noted below.

The company also controls, through ownership of stock, the Pittsburgh, Cincinnati & St. Louis and its leased lines, 596.9 miles; the Chicago, St. Louis & Pittsburgh, 580.5; the St. Louis, Vandalia & Terre Haute, 157.8; the Cincinnati, Richmond & Fort Wayne, 90.9, and the East St. Louis & Carondelet, 11.5, making a total of 1,437.6 miles. Reports for these lines are made separately, and most of them have already been published.

The statements below relate to the operation of the 1,353 miles worked directly by the company.

The general account, condensed, is as follows:

Liabilities:

Capital stock	$20,000,000
Funded debt	16,950,000
Due lessor companies for supplies	831,832
Current accounts and balances	2,738,235
Reserve fund, leased roads	2,341,505
Profit and loss, credit balance	4,152,438
Total liabilities	$47,014,010

Assets:

Securities owned	$30,483,548
Real estate owned	153,283
Equipment owned	1,037,481
Union Line property	2,859 351
Betterments to leased roads	1,980,520
Supplies on hand	1,143,273
Miscellaneous assets	978,404
Sinking funds, Pennsylvania Co	1,456,244
" " leased roads	3,329,505
Accounts and balances receivable	2,892,418
Cash	687,983
Total assets	$47,014,010

The funded debt consists of $20,000,000 first-mortgage 4½ per cent. bonds and $3,200,000 registered 6 per cent. bonds, secured by special stock of Pittsburgh, Fort Wayne & Chicago Co.

TRAFFIC.

The passenger traffic and the average rate per passenger-mile, in cents, were:

	Pass. carried.	Pass.-miles.	Av. rate. Gross	Av. rate. Net.
P., Ft. W. & Chi	3,271,864	110,639 940	2.23	0.81
New Castle & B. V	140,061	1,391,393	2.97	1.03
Lawrence	53,797	667.270	2.56	*1.37
Mass. & Cleve	9,716	121,157	....	....
All., Niles & Ash	26,788	511,170	2.40	*0.12
Erie & Pitts	202,407	3,754.656	2.66	0.30
New Brighton & N. C	25,674	204,941	0.60	*0.50
N. W. Ohio	96,752	2,374,328	2.51	*0.14
Ash. & Pitts	105.145	1,573,178	2.38	*1.16
Cleve. & Pitts	1,112,020	22,483.843	2 42	0 53
Jeff., Mad. & Ind	983,569	16,964,745	2.45	0.13
Ind. & Vincennes	219,782	4,499,933	2.57	*0.68
Total	6,247,575	165,185.554	....	....
Total, 1883	6,323.168	185.506,622	....	....

* Loss.

The freight traffic and the average receipt per ton-mile in cents were:

	Tons car.	Ton-miles.	Av. rate. Gross.	Av. rate. Net.
P., Ft. W. & Chi	4,696,583	907,951,237	0.67	0.18
New Castle & B. V	1,543,550	16,097,582	1.36	0.73
Lawrence	1.122,596	16,931,591	1.08	0.55
Mass. & Cleve	23,963	82,978	....	....
All., Niles & Ash	154,829	3,965,674	0.97	0.57
Erie & Pittsburgh	729,884	40,673.334	0.86	0.11
New Brighton & N. C.	245,799	2,924 054	1.09	0.91
N. W. Ohio	288 454	20,802,180	0.81	*0.04
Ash. & Pitts	946,227	49,164,276	0.81	0.29
Cleve. & Pitts	2,413,456	209,297,980	0.93	0 31
Jeff., Mad. & Ind	2,197,14 :	62,482,637	1.30	0.31
Ind. & Vin	177,199	12,362,448	1.43	0.01
Total	14,539 682	1,333,735,971	....	....
Total, 1883	15,697.563	1,393,824.522	....	....

* Loss.

On nearly all the lines there was a decrease in passenger traffic, the total falling off being 20,321,068 passenger-miles, or 10.95 per cent. On most of the lines there was a decrease in the average rate and an increase in the cost.

There was also a decrease in freight traffic on most of the lines, the Jeffersonville, Madison & Indianapolis and the Indianapolis & Vincennes being the notable exceptions. The total decrease in freight traffic was 60,088,551 ton-miles, or 4.31 per cent. There was also a general decrease in the average rates, and a reduction in the cost of moving freight, not equal, however, to the decrease in earnings.

The New Brighton & New Castle road was only operated from Aug. 18, 1884, when it was first opened for traffic.

INCOME.

The income and profit and loss accounts for the year were as follows:

Net earnings, Union Line Bureau		$241,519
Rent, Monongahela Extension		51,147
" Real estate		35,566
" Equipment		217,055
Profit, New Castle & Beaver Valley		33,471
" Lawrence R. R.		6,801
Dividends on stocks		376,547
Interest on bonds		167,146
" " general accounts		26,497
Total revenue		$1,155.749
General expenses	$66,788	
Interest on car trusts	137,466	
" " bonds	759,346	
Loss on Pitts., Ft. W. & Chi	124,807	
" " Erie & Pitts	307,841	
" " Cleve. & Pitts	205,848	
" " Mass. & Cleve	20,502	
" " Ind. & Vincennes	218,902	
Advances, Cin., Rich. & Ft. Wayne	24,469	
		1,865,969
Deficit for the year		$710,220
Reserve fund, sinking funds leased lines		214,942
Settlement of old accounts		141,000
Total		$1,066,162
Profit and loss, balance, Jan. 1, 1884		5,218,600
Profit and loss, balance, Dec. 31, 1884		$4,152,438

This deficit of $710,220 on the lines directly operated compares with a profit of $72,829 in 1883. It may be noted that on several of the lines which do not appear in the income account, the rental paid is the net receipts, so that there was neither profit nor loss on the leases. The profits from the lines owned, if any, appear in the dividends received on stock.

GENERAL REMARKS.

"It will be noted that, owing to the depressed condition of the manufacturing interests of the country, and especially of the coal and iron industries connected with your Northwestern lines, there was a very large decrease in earnings as compared with 1883. Although every effort was made to reduce expenses, the net earnings were insufficient to meet the liabilities connected with your system of railways; the result on the Northwestern lines being a deficit of $710,220, and on the Southwestern lines a deficit of $147,210.

"During the year there were issued $1,250,000 of your 4½ per cent. bonds, making the entire issue of that series $13,750,000. Under the operation of the sinking fund $383,000 of these bonds were redeemed up to Dec. 31, 1884, leaving $13,367,000 outstanding; $1,000,000 of the 8 per cent. equipment bonds of the Pittsburgh, Fort Wayne & Chicago Railway Co., bearing date March 17, 1874, having fallen due March 1, 1884, a portion of the proceeds of your 4½ per cent. bonds was used for their purchase by your company.

"During the litigation connected with the lease of the former Columbus, Chicago & Indiana Central Railway, a large amount of real estate essential to the proper operation of that road was purchased by your company at Chicago, Richmond, Indianapolis and other points. The reorganization of that line having been completed, this real estate has been conveyed to the Chicago, St. Louis & Pittsburgh Railroad Co., in exchange for $808,000 of its first-mortgage 5 per cent. bonds.

"Of the 6 per cent. bonds of your company secured by the stock of the Pittsburgh, Fort Wayne & Chicago Railway Co. as collateral, $756,000 have been redeemed up to the close of the year, leaving $2,444,000 outstanding.

"Under a settlement made with the Grand Rapids & Indiana Railroad Co., your company has received in full payment of all sums due by that company $553,000 of its 6 per cent. 15-year bonds and $99,000 of its 5 per cent. 40-year bonds. The floating debt of the former company has now been entirely funded, and that property placed upon a basis more satisfactory to the interests involved.

"The New Brighton & New Castle Railroad has been constructed from Kenwood, a point on the Pittsburgh, Fort Wayne & Chicago Railway just west of New Brighton, to a connection with the New Castle & Beaver Valley Railroad at Wampum Junction, a distance of 12.5 miles. This road was opened for traffic Aug. 18, 1884.

"The Meadville Railroad, formerly operated by your company under lease, having been sold out under foreclosure proceedings, was turned over to its owners Jan. 31, 1884, and after that date ceased to be operated by your company.

"The aggregate tonnage moved shows a considerable reduction as compared with the previous year, while there was also a material reduction in the mileage. The aggregate passenger traffic also shows a falling off, while in almost every instance the rates received on both classes of traffic were materially less than in 1883. There is no doubt that under existing circumstances the cost of moving both freight and passengers has practically reached its minimum, and that if the lines are expected to maintain themselves in proper condition to accommodate the traffic tributary thereto, they must receive in the future a compensation more nearly corresponding to the service rendered than they have in the past.

"The general condition of your property was fairly maintained during the year. There were laid on the lines operated by your company 9,860 tons of steel rails, and on the lines otherwise controlled 17,587 tons, including 4,415 tons on the Chicago, St. Louis & Pittsburgh Railroad, and 1,593 tons on the St. Louis, Vandalia & Terre Haute Railroad.

"There was a general improvement in the average load per car and per train.

"The movement of traffic upon many of your lines was again seriously interfered with in February, 1884, by heavy floods in the Ohio River and its tributaries. From Feb. 5 to 8 inclusive, the tracks of the Pittsburgh, Fort Wayne & Chicago Railway, between Shields and Bridgewater, of the Erie & Ashtabula Division from Warren to Wheatland, and of the River and the Tuscarawas divisions of the Cleveland & Pittsburgh Railroad were covered with water and traffic suspended. The tracks in and around Jeffersonville on the Jeffersonville, Madison & Indianapolis Railroad were also impassable, and from the 12th to the 21st all freight traffic was suspended, and passengers, baggage, mail and express were transferred by boat for about a mile, from Prison station to a point north of Jeffersonville. At Madison the water reached the highest point known, covering the tracks and station buildings and stopping all traffic for 14 days."

The accounts of the lines operated are stated separately as follows:

PITTSBURGH, FORT WAYNE & CHICAGO.

The earnings of this road, 468.3 miles, were:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings	$9,164,041	$10,844,357	D. $1,680,316	15.5
Expenses	6,034,889	6,916,669	D. 881,780	12.7
Net earnings	$3,127,152	$3,927,688	D. $798,536	20.3
Less Clev. & Pitt., joint earnings	261,959	301,467	D. 39,508	13.1
Balance	$2,867,193	$3,626,221	D. $759,028	20 9
Rental	2,992,000	2,965 073	I. 26,927	0.9
Surplus	$124,807*	$661,148	D. $785,955	....

* Deficit.

Renewals included 5,334 tons steel rails, 220,888 new ties and 30 miles of stone ballast. The betterments amounted to $184,661.

ALLIANCE, NILES & ASHTABULA.

The operations of this line, 27.5 miles, were:

	1884.	1883.	Inc. or Dec.	P.c.
Earnings	$49,616	$51,096	D. $1,480	2.9
Expenses	28,849	36.933	D. 8,084	21.9
Net earnings	$20,767	$14,163	I. $6,604	46.6
Hire of equipment	4,198	4,831	D. 633	13 2
Balance	$16,569	$9,332	I. $7,237	77.8

Additional sidings for coal traffic were built during the year.

MASSILLON & CLEVELAND.

The earnings of this line of 12.2 miles were:

	1884.	1883.	Inc. or Dec.	P.c.
Earnings	$6,944	$4,934	I. $2,010	40.8
Expenses	7,446	7,424	I. 22	0.3
Deficit	$502	$2,490	D. $1,988	79.9
Rental	20,000	20,000	.. ..	....
Loss	$20,502	$22,490	D. $1,988	9.3

This line is now almost without business, owing to the construction of other roads taking the traffic which it formerly had.

NEW CASTLE & BEAVER VALLEY.

The earnings of this line, 14.9 miles, were:

	1884.	1883.	Decrease.	P. c.
Earnings	$270,245	$406,472	136,227	33.6
Expenses	128,676	155,133	26,457	17.1
Net earnings	$141,569	$251,339	$109,770	43.7
Rental	108,098	162,589	54,491	33.6
Profit	$33,471	$88,750	$55,279	63.5

The rental is 40 per cent. of gross earnings. The freight traffic on this line shows a considerable decrease.

LAWRENCE.

The operations of this line, 22 miles, were as follows:

	1884.	1883.	Decrease.	P. c.
Earnings	$204,109	$257,109	$53,000	20.6
Expenses	115,664	121,718	6,054	5.0
Net earnings	$88,445	$135,391	$46,946	34.7
Rental	81,644	102,844	21,200	20.6
Profit	$6,801	$32,547	$25,746	82.2

The rental is 40 per cent. of gross earnings. Renewals included 72 tons of steel rails and 5,665 new ties.

ERIE & PITTSBURGH.

The earnings of this line, 101.2 miles, were:

	1884.	1883.	Inc. or Dec.	P. c.
Earnings	$484,590	$601,033	D. $116,443	19.4
Expenses	394,192	462,372	D. 68,180	14.7
Net earnings	$90,398	$138,661	D. $48,263	34.9
Rental	398,239	398,732	D. 493	0.1
Loss	$307,841	$260,071	I. $47,770	18.4

There were 1,052 tons steel rails and 16,702 new ties used in renewals. Improvements are in progress at the Erie docks.

NEW BRIGHTON & NEW CASTLE.

This road, 12.5 miles, was opened for traffic Aug. 18. The earnings from that date to the close of the year were $34,684; expenses, $7,582; net earnings, $27,102. Hire of equipment amounted to $2,435, leaving $24,667 net balance

ASHTABULA & PITTSBURGH.

The operations of this line, 62.6 miles, were as follows:

	1885.	1884.	Inc. or Dec.	P. c
Earnings	$387.188	$447.087	D. $59,899	13 4
Expenses	264,816	254.880	I. 9,936	3.9
Net earnings	$122,372	$192.207	D. $69,835	36.3
Hire of equipment	28,679	28,375	I. 304	1.1
Net profit	$93,693	$163,832	D. $70,139	42.8

There were used in renewals 979 tons of steel and 13,625 new ties. Additional dock facilities at Ashtabula are much needed.

CLEVELAND & PITTSBURGH.

The earnings of this road, 225.4 miles, were:

	1884.	1883.	Inc. or Dec.	P.c.
Earnings	$2,591,226	$3,089,551	D. $498,325	16.1
Expenses	1,712,651	1,743,044	D. 30,393	1.7
Net earnings	$878,575	$1,346,507	D. $467,932	34.8
P., Ft. W. & Chi., joint earnings	195,764	259,874	D. 64,110	24.7
Total n t	$1,074,339	$1,606,381	D. $532,042	33.1
Rental	1,280,187	1,262,523	I. 17,664	1.4
Profit or loss	L. $205,848	P.$343.858	D. $549,706	....

There were 1,070 tons of steel rails and 63,569 ties used in renewals. Expenditures for betterments last year were $92,615, chiefly for new iron bridges.

NORTHWESTERN OHIO.

The earnings of this road, 85.7 miles, were as follows:

	1884.	1883.	Inc. or Dec.	P. c.
Eearnings	$270,799	$285.275	D. $14,476	5.1
Expenses	240,170	332,053	D. 91,883	27.7
Net earnings	$30,629	$46,778*	D. $17,407	....
Hire of eq'ment, etc	35,089	30,847	I. 4,242	13.8
Loss	$4,460	$77,625	D. $73,165	94.1

*Deficit.

There were used in renewals 802 tons of steel rails and 28,516 new ties. The decrease in expenses was due to the absence of the usual destructive spring flood in the Maumee River.

JEFFERSONVILLE, MADISON & INDIANAPOLIS.

The operations of this road, 204.1 miles, were:

	1884.	1883	Inc. or Dec.	P. c.
Earnings	$1.304,110	$1,426.893	D. $122,783	8.6
Expenses	1,012,106	1.070,110	D. 58,004	5.8
Net earnings	$292,004	$356,783	D. $64,779	18.2
Less half deficit, Cambridge Extension	12,063	6,039	I. 6,024	99.8
Balance	$279,941	$350,744	D. 70,803	20.2

The rental paid for this road is the net earnings. There were used in renewals 2,076 tons steel rails and 79,071 new ties.

INDIANAPOLIS & VINCENNES.

The operations of this road, 116.6 miles, were:

	1884.	1883.	Decrease.	P. c.
Earnings	$312,533	$314.628	$2,095	0.7
Expenses	322,103	325,660	3,557	1.1
Deficit	$9.570	$11,032	$1,462	13.3
Interest	206,000	206,000	.....	.....
Hire of equipment	3,332	4,838	1,506	31.1
Total loss	$218,902	$221,870	$2,968	1.3

There were 1,215 tons of steel rails and 13,539 ties used in renewals; 233 tons of iron rails and 13,539 ties in new construction, building the Green County Coal Branch from Bushrod to Island City, 4 miles.

UNION LINE BUREAU.

The statement of this department of the company is as follows:

	1884.	1883.	Inc. or Dec.	P.c.
Earnings	$554,299	$550,813	I. $3,486	0.6
Expenses	312,780	348,543	D. 35,763	10.3
Net earnings	$241,519	$202,270	I. $39,248	19.4

The net earnings last year were made up of $553,545 car mileage and $754 miscellaneous; the expenses, $211,051 for maintenance of cars and $101,729 general expenses. The decrease in tonnage was 1.75 per cent. and in mileage 1.07 per cent.; the rate per ton-mile decreased from 0.81 cent in 1883 to 0.71 cent in 1884, a loss of 0.10 cent, or 15.5 per cent.

EAST ST. LOUIS & CARONDELET.

This road is not operated by the Pennsylvania Co., but its statement is given here, not having been heretofore published. It is 11.5 miles long, and is used as a freight connection between the lines entering East St. Louis and South St. Louis and Carondelet. The operations were as follows:

	1884.	1883.	Decrease.	P. c.
Earnings	$73,408	$86,942	$13,534	15.6
Expenses	66,638	79,884	13,246	16.6
Net earnings	$6,770	$7,058	$288	4.1
Interest, etc	14,000	17,732	3,732	21.1
Deficit	$7,230	$10,674	$3,444	32.2

The earnings last year were $6,383 gross and $589 net per mile. The traffic for the year is not given. The working expenses last year were 90.8 per cent. of gross earnings.